Youth aspirations, gender, and peer influences in eastern Uganda

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Thesis submitted for the degree of Doctor of Philosophy

School of International Development
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November 2018

Abstract

The ability of people to invest effectively in their future is based on their 'capacity to aspire'. Lacking the capacity to aspire can shape aspirations that manifest a deprived position. To identify pathways out of poverty, this thesis aims to understand the role the social environment plays in forming aspirations. Using data on Ugandan students, the three empirical chapters concentrate on the role of gender, peers, and envy, respectively.

First, this thesis examines gender differences in the weight given to economic aspirations relative to competing aspirations in the social and educational spheres. Differences between boys and girls are found when controlling for socioeconomic background. Boys attach more importance to economic independence, while girls attach more value to competing aspirations. The chapter concludes that boys and girls internalise different aspirations that fit their gender roles.

Second, the thesis investigates the extent to which the aspirations of adolescents are influenced by the aspirations of friends. It zooms in on three pairs of competing aspirations and considers the relationship with classmates to elicit friendship ties. To identify peer effects in aspirations, friends' aspirations are instrumented with the characteristics of non-overlapping peers. The results reveal two positive peer effects, emphasising potential spill-over effects when implementing development programmes that aim to lift economic aspirations.

The thesis ends with a real-effort experiment, examining envy that reduces inequality either by stimulating competition or destroying earnings of top performers. Disentangling both effects is crucial to understand the costs and benefits of inequality. Three treatments are implemented: performance feedback, money burning, and a combination of both. Results provide evidence that performance feedback increases effort, and the threat of money burning decreases effort, but only when combined with feedback. It concludes that social comparison can stimulate, but in the presence of destructive behaviour also demotivate people, leading to lower effort.

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Acknowledgements

Writing a PhD thesis in isolation can be challenging and lonesome at times. There are a number of people who greatly supported me during this journey, and who deserve a special thank you.

First, my main gratitude goes out to my supervisors Ben D'Exelle and Arjan Verschoor. Ben, thank you for supporting me to secure a place at the School of International Development early 2014 and allowing me the freedom to write my research proposal. Throughout the years, you have suggested very helpful research ideas in periods where I did not know how to proceed with my thesis and questioned all the work I had done until then. I could always ask for your advice, even when I struggled with the tiniest of issues, and you always provided a solution. I am also very grateful that you agreed to prolong our supervisory–student relationship when I decided to move to Melbourne, which meant we had to meet over Skype and take account of the 10- or 11-hour time difference. Arjan, I always enjoyed our discussions and your willingness to help me with the chapters conceptually. I also very much appreciated our time together in Mbale, where we did not only talk about how to conduct the fieldwork in the best way possible, but also about everything non-PhD related.

Joshua Balungira, I really owe you, as you coordinated all my fieldwork in Uganda and provided extensive expertise knowledge on the research area. The same holds for Zam, Apollo, Isaac, Charles, Pamela Kate and Floris, who provided the best assistance possible during the data collection phases. Without you, the fieldwork would not only have been much less fun, it would simply not have been possible. I will always remember our trips back to Mbale after a long day of data collection in Sironko during the wet season: in an overcrowded, old taxi down the mountain slope, on a muddy road, in the dark. We were always happy to come back to Mbale in one piece, just to get back into that same old taxi the next day. Naturally, I need to thank the staff at the Ugandan high schools who allowed me to conduct my study at their schools, and all the students who took the time and effort to participate. Without your cooperation, there would be no thesis.

I am also very grateful that I met the most inspiring people during my time in Norwich. First of all, I need to thank my fellow PhD colleagues at the School of

International Development (DEV) for their friendship and the most enjoyable moments. Ines, Stephen, Luis, Borja, David, Sonja, Will, Ailie, Rosanne, Pablo, Hao, and many others, thank you for all those coffees, lunches, beers, pot-luck dinners, house parties, and other procrastinating activities. A special thanks also to my former housemates Joan and Patricia, the most generous and kind people I have met in Norwich.

Naturally, I would like to thank my parents, brother and sister, who's support played a vital role in conducting this study. Your support included, amongst many things, listening to me complain about how cumbersome the writing process was, helping me move house again, and fixing up numerous laptops. I am very grateful that you encouraged me to take this step and for all your help and support over the years.

The final, but perhaps most important person I would like to thank is my partner Rachel. You have also completed a PhD thesis and know how challenging and demanding it is. You visited me in Uganda, which was amazing as I could show you the country I had spent a fair amount of time in. After that, we moved to Melbourne together, where you had to endure my daily complaints. Thank you for being so understanding and thank you for your unconditional love, support, and belief that I would finalise this thesis. I look forward to the rest of our lives together, wherever in the world that may be.

Rik Habraken
November 2018

Chapter 1. Introduction

1.1. Problem statement

Aspirations and poverty have a strong relationship. Aspirations shape the ability to successfully invest in the future, which is essential for escaping poverty. Appadurai (2004) calls this the 'capacity to aspire', which revolves around the navigational capacity to express aspirations in straightforward goals and outcomes and produce clear narratives and pathways in the existing social context that should lead to their attainment. For the poor, the navigational capacity is smaller than for the non-poor. First, the non-poor have more experience with the relationship between aspirations and their outcomes, and second, the non-poor have practised their ability to navigate the relationship between aspirations and outcomes more, as they are better able to frequently experiment and explore future opportunities. The poor have fewer opportunities to experiment, and their experience with pathways that lead to the attainment of their aspirations is more limited.

The consequence of a limited capacity to aspire is that poor people often remain poor. They are more likely to have low aspirations, whereas the relatively rich have a more fully developed capacity to aspire. The consequences of low aspirations can be severe: low aspirations result in low(er) human capital investments and under-investment in income-generating activities, which in turn manifest the poor's deprived position. For example, aspired income is a positive function of attained income (Knight & Gunatilaka, 2012; Stutzer, 2004) while educational aspirations have an impact on educational performance (Beaman, Duflo, Pande, & Topalova, 2012; Page, Garboua, & Montmarquette, 2007). This rationale implies that poverty is a result of low aspirations, and poverty can only be alleviated if the poor change their mindsets.

However, poverty is not merely a 'short-coming' of the poor, as Camfield (2015) states. Living in extreme poverty has a grave psychological impact on one's cognitive ability and limits the capacity to aspire (Maclay & Marsden, 2013). It means that poverty influences decision-making about the future "by changing the decision-making process itself" (Duflo, 2006, p. 376). Both Duflo (2006) and Mani, Mullainathan, Shafir, and Zhao (2013) show that poverty impedes cognitive capacities, which make the poor not just rational decision-makers that manage their scarce

resources. Together with a lack of resources and access to relevant information, this limited cognitive capacity causes the poor to deal with a complex decision-making process where they carefully need to trade off their aspirations. Their poverty does not allow manoeuvring and exploring future alternatives, and flawed judgement on which aspirations to pursue cannot be mitigated (Bertrand, Mullainathan, & Shafir, 2004). Moreover, poverty can also lead to aspiration failure, where an individual is not able to aspire to one's full potential (Dalton, Ghosal, & Mani, 2016). Crettaz and Suter (2013) demonstrate that eventually, the poor may come to terms with their socioeconomic hardship and perpetuate a 'lower' status by taking decisions that maintain and manifest their deprived social position. In sum, poverty has psychological effects which affect effective decision- making, which in turn impacts attainment and well-being. This endogenous mechanism is known as an aspiration poverty trap.

Aspirations are not only based on past individual experiences, but also take form in the social environment (Genicot & Ray, 2017). This holds especially for youngsters that have not yet attained life-determining achievements. The aspirations of the poor are not shaped in isolation and, broadly defined, two social mechanisms are at play. First, they adopt the aspirations of their social environment, but they may not always be beneficial to them. Appadurai (2004) states that the poor may even comply with dominant social norms that are the primary cause of their deprivation. Especially youngsters are believed to be susceptible to what others consider relevant and socially appropriate to do. For example, various studies show that youngsters replicate the aspirations of parents, which may still be based on traditional conceptions of society that have evolved over time (e.g. gender norms) (Beaman et al., 2012; Dercon & Singh, 2013). Especially in a situation of poverty, successful reference points are limited (Genicot & Ray, 2017). Second, in order to have productive aspirations, "the poor must perceive themselves as both capable and in control of their lives" (Flechtner, 2014, p. 2). Bandura (1997) demonstrated that social comparison with successful, like-minded people might enable others to realise they hold similar competences required to be successful. Exposure to successful peers is also an intervention proven to be successful in raising the aspirations of the poor in several developing country contexts (see, for example, Beaman et al. (2012) on India, Bernard, Dercon, Orkin, and Taffesse (2014) on Ethiopia, and (Macours & Vakis, 2014) on Nicaragua).

Despite an increasing body of literature studying the relationship between aspirations and poverty, this thesis focuses on three main domains that remain under-researched: 1) gender norms and gender differences in multidimensional aspirations, 2) conformity to the aspirations of peers, and 3) the effect of envy. All three of them relate to how the social environment shapes the aspirations of young people. Studying young people's aspirations is deemed necessary as more than 60% of the extreme poor in developing countries are below 25 years old (Castañeda et al., 2016).

First, up until now most studies on aspirations have neglected the multidimensional character of aspirations, and limited research has been done on what poor people aspire or value in the long-term (Copestake & Camfield, 2010). The vast majority of studies focuses either on income, wealth, education, or health and neglects the notion that aspirations are interdependent. While the non-poor have the opportunity to experiment with various potential pathways to success, a lack of resources, relevant information and opportunities force the poor to carefully trade off one aspiration against the other before deciding on how to advance in life. The first part of this thesis focuses on economic empowerment and the aspiration to become economically independent and aims to demonstrate that in the endeavour to obtain such economic autonomy youngsters experience competition from alternative aspirations. Central in the trading off of alternatives stands the role of gender. Young boys and girls internalise different gender roles and aspire according to what is considered socially acceptable for their gender, with potential risk of perpetuating gender inequalities.

Second, aspirations are shaped mainly in the social environment, but studies on the effect of peers on aspirations (Beaman et al., 2012; Bernard et al., 2014; Macours & Vakis, 2014) do not address how young people influence each other's' aspirations through social interactions in networks. Peer effects can then be another potential cause of the limitation of the capacity to aspire, but they can also be a potential instrument for overcoming what poverty does to the capacity to aspire. Gaining insight into this mechanism could, therefore, be valuable for development programmes that aim to raise aspiration levels and hope to benefit from potential spill-over effects.

Third, exposing poor people to successful peers is generally believed to improve outcomes and to motivate people to invest in their future. However, especially in small-scale societies social comparison can also render envy that has the potential to lower the effort that young people want to invest in improving their lives. A better

understanding of how envy and the anticipation on envy of others have an impact on effort and welfare in general can aid interventions that aim to stimulate the productivity of the poor through exposure to successful peers.

Altogether, even though an increasing body of literature addresses the relationship between aspirations and poverty, it does not provide an overarching image of how the social environment shapes the aspirations of young people. Therefore, this thesis uses the following research question:

How does the social environment shape the aspirations of youngsters?

The next section presents the research setting first, followed by a discussion of the main concepts and ideas used in this thesis. After that, the main research questions are presented, together with an elaboration on how the thesis has collected data and how that data was analysed. This chapter ends with an outline of the thesis and shortly touches on the three empirical chapters and their relevance.

1.2. Research setting

Uganda ranks as one of the least developed countries in the world (OECD, 2018). The Uganda Bureau of Statistics (2018a) shows that monthly income per capita amounted to 190,000 UGX in 2017, which is the equivalent of approximately 50 USD. More than half of this income is spent on food. Moreover, 75% of a total of 38 million Ugandans live in rural areas (Uganda Bureau of Statistics, 2018c). Over the years, a reduction in poverty levels to approximately 21% has led to, amongst other things, an increased life expectancy of 60 years (United Nations, 2017b). However, 8 million Ugandans still live in extreme poverty, and recently the proportion of the population living below the poverty line has gone up again (Mejia-Mantilla, 2018). What further stands out is that the vast majority of the Ugandan population is below 25 years old, and 50% is even younger than 15 years old (Uganda Bureau of Statistics, 2018b). This makes Uganda the country with the highest population growth in East Africa (United Nations, 2017a). Map 1 shows the main research area in Uganda, located in the eastern part of the country near the border with Kenya.

1.2.1 Eastern Uganda

In Uganda, the thesis focuses on the Sironko district and Mbale district, two adjacent districts located in the Greater Mbale area in the eastern part of the country. Sironko district is mostly rural. In Mbale district, however, we only include Mbale town to allow a stratified sample along the rural/urban dimension. The two black circles in Map 1 represent the two locations. The reason for conducting our research here is based on the fact that both districts are among the poorest, but most densely populated areas in Uganda. Over the years, decentralisation has led to the creation of new names for the research area(s). To understand a further elaboration on the socioeconomic statistics, it is relevant to explain that both districts are part of the Bagisu region, which is part of the Elgon region, which in turn belongs to the Eastern region of Uganda.

Sironko district has a population of approximately 242,000, with 86% living in rural areas. Mbale district has a much larger population of around 490,000, and 75% lives in rural areas. Mbale town is the largest urban centre in Mbale district with a population of 93,000 (Uganda Bureau of Statistics, 2016). Both districts belong to the Elgon region where on average 35% of the residents live below the poverty line. This percentage is a statistically significant increase compared to the percentage of 2012, implying that the poverty level in this region is growing (Uganda Bureau of Statistics, 2018c). In both Sironko and Mbale district, an average household consists of exactly 4.4 members, which is slightly below the national average of 4.7 (Uganda Bureau of Statistics, 2018b). In the Elgon region, 47% of the population is younger than 14 years old which reveals a high fertility rate (Uganda Bureau of Statistics, 2018c). Almost 60% of the population in the Elgon region is working in subsistence agriculture, which is among the highest of all regions in Uganda. The main agricultural activities in the wider Eastern region include farming Arabica coffee beans, bananas, maize, sweet potatoes, and cassava and to a lesser extent herding livestock (Uganda Bureau of Statistics, 2017). After the capital Kampala, population density in the two areas is the highest in Uganda, even though both districts are mainly rural (Uganda Bureau of Statistics, 2016). Most of the land is cultivated, and in combination with high population density, land pressure has led and still leads to social conflicts (Heald, 1998).

Map 1. The research area in Uganda

Retrieved from www.google.com/maps, October 28th, 2018.

1.2.2. Socioeconomic gender differences

As the first part of this thesis aims to address gender differences in aspirations, it warrants to present an overview of any existing socioeconomic gender differences in the research area. The Ugandan demographic and health survey (Uganda Bureau of Statistics, 2018b) provides a wide range of statistics that reveal large socioeconomic gender differences in the Bugisu area (a smaller part of the Elgon area). Regarding employment and economic empowerment, 79% of women aged between 15-49 have some form of employment, including subsistence farming, whereas 94% of the men in the same age category has employment. The vast majority of working women is self-

employed, and only 8.7% of the women with employment have a professional job, while for employed men this is 13.2%. Moreover, only 53% of married women can decide independently on how their own earnings are used, and 31% of women indicate they own land jointly or by themselves, while 48% of men indicate they own land jointly or by themselves. This difference is not surprising, as the dominant Gisu tribe in the research area is patrilineal, and often only sons inherit land. With regard to primary school enrolment, there are no gender differences, but secondary school enrolment reveals a higher gross enrolment ratio for boys than for girls. In addition, only 6.3% of all women aged between 15-49 have completed secondary school or higher, whereas for men this percentage is established at 11.1%. Altogether, these statistics reveal a substantial economic and educational gender gap.

Looking at statistics on marriage, sexual activity and HIV prevalence, the Ugandan demographic and health survey (Uganda Bureau of Statistics, 2018b) shows that in Uganda, 61% of women and 54% of men aged between 15-49 are married or live together with a partner. 26% of women and 41% of men in that same age range have never married. Unfortunately, these statistics are not specified at the regional or district level. Moreover, in the Bagisu region, the median age of a woman at first marriage (ranging between 20-49) is 18.2 years, whereas for men this is 22.3 years. Polygamy is also still prevalent in the Bagisu region, with 19% of the married women having a husband that also married at least one other woman. The median age at first sexual intercourse of girls is 16.7, while for boys this is 17.1. Also, 34% of the married women in the Bagisu area indicate they cannot take healthcare decisions independently. Last, the prevalence of HIV among adults in Uganda between the age 15 to 64 is 7.6% among women and 4.7% among men (Uganda Ministry of Health, 2017). In sum, these statistics point out that women in the research area find themselves in a more vulnerable and dependent position than men.

1.2.3. The Gisu

When studying the aspirations of the poor, it is essential to understand the cultural context in which they are anchored. Ethnically, the Sironko and Mbale districts are populated by the Gisu tribe, which is part of the Eastern Lacustrine Bantu (Byrnes, 1992). They constitute a rough 5% of the total population in Uganda (Uganda Bureau of Statistics, 2018b). Even though they are grouped as Gisu tribe, there is significant

variation in clans and sub-groups, with substantial levels of animosity within lineages (Heald, 1998). The Gisu speak Lugisu, which is linked to Masaaba, originally a Bantu language, but due to the myriad of clans, many dialects exist (Brown, 1970). In her anthropological study of the Gisu, Heald (1998) illustrates that they share borders with the Teso, Sebei (both Nilotic), Gwere, and Nyole (both Bantu). She also states that relatively little is known about the history of the Gisu, and by having the same ancestors as the Bukusu tribe in Kenya, they are believed to share strong cultural links. Ancestral stories claim that the Gisu people are descendants from Mount Elgon, a non-active stratovolcano on the border of Uganda and Kenya and locally known as Masaba (Heald, 1998). Ba-Masaba refers to all the people living on the slopes of Mount Elgon (La Fontaine, 2017). Even though the Gisu tribe share various cultural practices with other groups, disposing of the idea of an exclusive identity, they claim to be a unique culture on the base of their descent, language, and male circumcision (Heald, 1998).

Heald (1998) also points out that male circumcision feeds the Gisu's collective identity as men, which distinguishes them from all other men not circumcised. After circumcision, men receive resources that should enable them to live an autonomous life; only those circumcised, moving from boyhood to manhood as a '*rite de passage*' (i.e. social transition), are considered true men privileged to have ownership over land and resources. This socially embraced masculinity comes with responsibilities revolving around providing and protecting direct kin and the idea of a self-made man. The Gisu culture, therefore, drives male aspirations of self-determination based on autonomy and independence (Heald, 1998). However, failing to live up to these expectations can create feelings of frustration and envy as competition is high among young men, encouraging violence amongst them (Heald, 1998; Kituyi, 2007). Women, on the other hand, are socialised as carers and nurtures and considered less violent than men. As a consequence, the Gisu culture brings forward intricate gender relations in situations where women take over provision responsibilities (e.g. female-headed households), opposing the idea of male masculinity (Kituyi, 2007).

The cited studies on the research area make clear that the added value of the Gisu region for conducting this research project not only lies in the poor living conditions that allow linking aspirations and poverty, but also in how well existing studies have documented aspirations of the Gisu, their prescribed gender roles, and the importance of competition among young people.

1.3. Conceptual framework

This research project aims to examine the role of the social environment in shaping aspirations, providing more insight into (the formation of) aspirations of youngsters in Uganda. Understanding the interaction between the social environment and aspirations could offer new insights into how youngsters may be locked in an aspiration poverty trap, and how to possibly avoid it. The next section first defines what aspirations are, and why it is relevant to focus on the aspirations of young people, after which it will elaborate on the social environment, which is further broken down into gender norms and peer influences.

1.3.1. Aspirations

Appadurai (2004, p. 67) describes an aspiration as something that is related to "wants, preferences, choices, and calculations". His definition signposts that aspirations have no straightforward description. In general, aspirations are defined as a desire or ambition to achieve a certain goal or target (Bernard & Taffesse, 2014). Aspirations are also often thought of being linked to beliefs and expectations of the future, but Macbrayne (1987, p. 1) provides a clear distinction between aspirations and expectations: "Aspirations are defined as an individual's desire to obtain a status object or goal such as a particular occupation or level of education". She then explains that "expectations are the individual's estimation of the likelihood of attaining those goals, plans, ambitions or dreams" (Macbrayne, 1987, p. 1).

Aspirations are also different from beliefs. Denzau and North (1994) explain belief structures as individual attitudes about the structure of one's world and the relationship between behaviour and attainment of the individual and others in that world. Bernard et al. (2014, p. 4) point out that aspirations, beliefs and expectations are related: "the beliefs held by individuals about their environment and themselves, including expectations, will influence their aspirations". This thesis builds on this and brings forward its own working definition: aspirations are mid-term life goals that are realistically achievable as a result of one's individual actions.

Research on aspirations is interdisciplinary, and according to Ibrahim (2011), each discipline conceptualises aspirations differently. This thesis follows her sum-up of relevant perspectives and presents them in random order. First, an economic

perspective relates aspirations to the bounded rationality approach developed by Simon (1978). This approach is based on economic decision making and suggests that economic agents are dealing with bounded rationality resulting from a complex world, which can limit cognitive capabilities. Consequently, aspirational decision-making (i.e. which aspiration to attain at the expense of another, creating a preference order) is an optimisation problem based on searching for alternative life scenarios that meet certain aspirations. When an agent discovers an alternative that satisfies an aspiration or exceeds existing aspiration levels, the search is terminated, and the suboptimal alternative is chosen without searching further for the most optimal outcome. Selten (1999) adds to this the dynamic nature of aspirations and proposes an aspiration adaptation theory. Where satisfactory alternatives are easy to find, the initial aspiration levels are raised until they are not attainable anymore, and lowered when searching for satisfactory alternatives proves to be difficult until aspiration levels are attainable again. This implies that, in theory, aspirations can be the result of optimising behaviour, and a rational economic agent can maximise utility, but only when all information is available and alternatives (and their probability of attainment) are known, aspirations are consistent, and an agent acts accordingly. In a developing country context, however, the lack of information about alternatives, the path to their attainment, and their return is often lacking or insufficient. In addition, individuals that base their decisions on the most satisficing alternative instead of the one maximising utility are more likely to attain lower outcomes (Heifetz & Minelli, 2015).

A psychological perspective focuses mainly on the effect of aspirations on expectations (and vice versa), as shown by Heslin (2003), and the relationship between aspirations and attainment (Beal & Crockett, 2010). Other studies also investigate how identity has an influence on aspirations, for example, the effect of priming gender roles on career aspirations (Rudman & Phelan, 2010), or how personality traits affect aspirations and career trajectories (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). An increasing number of studies are based on this discipline and examine the relationship between poverty and psychological constraints, also known as the poverty of scarcity. According to these studies (Haushofer & Fehr, 2014; Mani et al., 2013; Mullainathan & Shafir, 2013), poverty causes stress and a negative mindset, which results in short-term thinking and risk evasive decision making. Consequently, these decisions may then manifest socioeconomic hardship.

From sociological and anthropological perspectives, aspirations are considered part of larger societal and cultural norms. “They are always formed in interaction and in the thick of social life” (Appadurai, 2004, p. 67). Ray (2006) adds to this and discusses how aspirations are based on the social environment and how individuals adapt to aspirations of peers in their cognitive neighbourhood. According to him, aspirations should therefore not simply be regarded as consumer preferences. In subsequent work, Genicot and Ray (2017) develop a theory on how society-wide outcomes affect the aspirations at an individual level, which in turn affect wider societal outcomes.

To gain a more comprehensive conceptual understanding of aspirations, this thesis follows Bernard and Taffesse (2014) who propose three distinct characteristics that are acknowledged in each academic discipline. First, aspirations are future-oriented, as desires or ambitions are believed to determine behaviour for the future. Lybbert and Wydick (2018) relate this to hope, as decisions and behaviour are based on a belief that specific actions will improve future outcomes. This mechanism also works the other way around, and goal attainment and life experiences of the past also change aspirations over time. Aspirations are thus endogenous reference points that shift with goals accomplished (Dalton et al., 2016).

Second, aspirations are motivators and determine how much time, effort, and resources individuals put in achieving and attaining them. From a ‘development perspective', Genicot and Ray (2017) state that aspirations mainly motivate human capital investments and strategic livelihood decisions. Also, Macours and Vakis (2014) demonstrate that in developing countries aspirations are highly relevant for escaping poverty as they determine household investments, for example in the education of children, nutrition and income-generating activities.

Third, aspirations span multiple interrelated aspects of life, like health, income, wealth, education, but also social security and friendship, amongst many others. Some dimensions are aspired over others. These *trade-offs* bear significance as specific dimensions are considered more relevant for escaping poverty than others. Taking individual constraints, capacities, and opportunities into account, one cannot aspire to do well in all dimensions; some of them are considered more important than others, implying a classification of aspirations on base of the intrinsic values attached to them. Therefore, each individual has a different combination of aspirations which constitute a desired long-term life scenario. This set of aspirations is shaped by sociocultural norms, (the lack of) exposure to success stories or role models, and access to tangible

resources, which determine an equilibrium as a set of aspirations that gives the highest level of ‘satisfaction’ to an individual within his or her capacity to aspire. So, the individual configuration of an aspirational set is the result of (continuous) trade-offs between aspirations, resulting in the most aspired combination of dimensions. Naturally, this configuration is dynamic and changes when the environment changes. In addition, the importance of each aspirational dimension is contextual (Bernard & Taffesse, 2014; Copestake & Camfield, 2010; Ibrahim, 2011).

Aspirations of young people are of particular importance. In developing countries, young people form the majority of the population (Castañeda et al., 2016). According to Sumberg et al. (2014), many of these young people in sub-Saharan Africa face unemployment or underemployment without any prospects of a better life. However, due to urbanisation, globalisation, and migration, in combination with new technological developments that stimulate exposure to other (more modern) ways of life, the aspirations of young people are more and more shaped outside their local context (Langevang & Gough, 2012). Together with increased attention for secondary education, this exposure has raised the aspirations of youngsters, but traditional social norms and beliefs, prescribed gender roles, and limited socioeconomic opportunities still largely constrain attainment (Sumberg et al., 2014). Although youngsters can function as a potential catalyst for development, they increasingly face a gap between their aspirations and what is perceived as possible to attain. Eventually, this may lead to aspiration failure and lower outcomes, as they accept and internalise their economic hardship.

In sum, the existing literature provides various conceptualisations of aspirations. In general, they are conceptualised as desires or ambitions to achieve goals. They are future-oriented, motivators, and multidimensional, and the configuration of the optimal set of aspirations is context-specific. Of particular interest are the aspirations of young people, as they are increasingly exposed to other ‘worlds', but opportunities to attain their aspirations are limited.

1.3.2. Social environment; gender norms and peer influences

This section provides a conceptualisation of how aspirations are the product of the interactions in social life. It places particular emphasis on the role of gender norms and the influence of peers, which is further broken down into peer effects and envy.

Aspirations are gender-specific and mainly rooted in socioeconomic context. A gender system largely shapes the belief structure about the relationship between behaviour and attainment on which aspirations are based. Interaction in social life play a vital role in sustaining that system (Ridgeway & Smith-Lovin, 2006). People start internalising gender role beliefs at a very young age, and in the process of maturing, youngsters begin to mirror the aspirations of people in their cognitive neighbourhood (e.g. parents and peers). Tafere (2014) for example, shows there is very little difference in the aspirations of children and the aspirations of their parents in Ethiopia. Over time, boys and girls develop different aspirations which they feel are appropriate for their gender role and realistic within the social boundaries of the society in which they live. Evidence from developed countries suggests, for example, that the aspirations of women are the result of internalised gender role beliefs (Eccles, 1994), and occupational aspirations are based on gender beliefs about task competency (Correll, 2004). Evidence from developing countries also suggest gender differences in aspirations. Favara (2017) finds a significant gender gap in the educational aspirations of boys and girls in Ethiopia. Her results also point out that especially in the poorest households, girls are less likely to aspire to go to university than boys from similar wealth levels. In addition, Bernard et al. (2014) show that Ethiopian women have lower income and social status aspirations and lower educational aspirations for their children than men.

Gender disparities in aspirations can have grave consequences. Boys and girls that adapt their aspirations to gender norms are likely to perpetuate existing social differences and inequalities through their aspirations and attainment. This holds especially for societies with large socioeconomic inequalities between gender groups. For example, Dercon and Singh (2013) show that children in India, Ethiopia, and Vietnam internalise the aspirations of parents. Their results show that this gender bias eventually perpetuates a gender gap in educational attainment (favouring girls in Vietnam while favouring boys in India). Boys and girls that aspire along gender norms can cause significant gender gaps in income, education, and health, amongst other dimensions, and often girls find themselves in disadvantaged positions. Eventually, young people transfer socially accepted, but inequality generating gender norms to the next generation, even if these norms are non-optimal or have evolved over time in other layers of society.

Aspirations are also shaped and transmitted through the influences of peers. This thesis breaks down peer influence into peer effects and envy. First, there is ample evidence from developed and developing countries that exposure to peers changes attitudes, aspirations, and future-oriented behaviour. Greene, Sullivan, and Beyard-Tyler (1982) show that exposing U.S. students to non-traditional role models can change the attitudes towards gender-appropriateness of certain careers. In addition, Bernard et al. (2014) and Macours and Vakis (2014) study the effect of exposure to peers in Ethiopia and India, respectively, and find that exposing people to successful, like-minded people leads to increased aspirations and higher human capital investments. Berg and Zia (2017) emphasise, however, that social influence only takes place when individuals can identify themselves with role models that bear strong similarities. They look at the effect of an education soap opera on responsible financial behaviour in South Africa and demonstrate that emotional connection with the main characters of the show is of great importance in motivating others. Comparing aspirations with peers in one's cognitive world is prone to take place in locality between those perceived close (Ray, 2006).

There is also a growing body of literature that addresses peer effects within social networks, based on an approach developed by Bramoullé, Djebbari, and Fortin (2009) and De Giorgi, Pellizzari, and Redaelli (2007). They use friendship networks and the non-overlapping peers' approach to identify peer effects in the use of recreational services and the choice of college majors. This model allows studying the feedback created by endogenous interactions between individuals and the population to which they belong, as it solves the reflection problem proposed by Manski (1993): how to study the influence of a group on an individual if that individual is part of the group? Various studies are based on the non-overlapping peers' approach, albeit in different contexts, and demonstrate that social interactions in networks lead to peer effects. Patacchini and Zenou (2012), Cingano and Rosolia (2012) and Arcidiacono, Foster, Goodpaster, and Kinsler (2012), amongst others, use individual specific friendship networks to examine the existence of peer effects in juvenile delinquency, employment rate, and school performance, respectively. In addition, Lin (2010) demonstrates that also the average characteristics of friends (i.e. friends' group composition) as a peer effect can influence the aspirations of an individual.

Peer effects are believed to work through two different mechanisms. First, individuals may learn from observing the outcomes of the aspirations of their friends

(Bikhchandani, Hirshleifer, & Welch, 1992). The idea of observational learning is that an individual imitates another person on the base of the belief that the other has relevant information that they do not possess (Manski, 2000). Second, and this is what this thesis primarily focuses on, individuals conform to the aspirations of their peers as they want to fit in socially. Akerlof and Kranton (2002) develop a theory that shows that students are mainly motivated by their identity and how well they fit in the social setting of the school, and utility is gained from conforming to the group norm. In the context of aspirations, conformity causes individuals to assimilate their ordering (and levels) of a set of aspirations to the ordering of aspirations of those in their cognitive proximity. This could mean, however, that the aspiration levels adopted may not always be necessarily the most optimal given the marginalised living conditions of poor young people.

The influence of peers may also evoke envy when levels of attainment are compared among peers. People tend to compare themselves and assess their performance in relation to the performance of similar others. For example, there are numerous studies (Fafchamps & Shilpi, 2008; Knight & Gunatilaka, 2010) that show how very poor people still express high levels of well-being as they are relatively better off than others in their neighbourhood. Social comparison also gives birth to envy, which has the potential to lift people out of poverty but also to keep poor people poor. Central in this stands the notion of effort, which according to the definition of aspirations presented in the previous section is an essential requirement for attainment as it determines human capital investments (i.e. effort 'translates' the aspiration into behaviour). Effort is also reference-dependent, which means that social comparison motivates people (Bolton & Ockenfels, 2000). Observing others doing well may create feelings of competitive envy, translated into the aspiration to keep up with others. On the other hand, top performers may aspire to stay ahead of others. Through social comparison, inequality between similar people has then the potential to lift them out of poverty.

However, in societies with strong egalitarian norms, social comparison can also lead to lower effort. As inequality grows, successful individuals may be targeted by envious, less successful peers (Zizzo & Oswald, 2001). In the presence of this so-called destructive envy, the consequence of being successful bears social costs. Successful individuals may want to reduce their effort to avoid social harassment or social exclusion, reducing inequality between them and less successful others. As a

result, inequality can then be costly, and social comparison is likely to keep poor people poor.

1.4. Research questions

This study aims to disentangle the social influences that shape the aspirations of young people. The following main research question is formulated:

How does the social environment shape the aspirations of youngsters?

We answer this question by focusing on the following three research-questions:

1. *To what extent do boys and girls aspire to economic independence and what is the influence of competing alternative aspirations?*

2. *How are the aspirations of youngsters affected by the aspirations of their friends?*

3. *What are the effects of competitive and destructive envy on effort?*

Research question 1 aims to explore the extent to which boys and girls aspire to obtain their economic independence, and whether they experience any competition from alternatives like marriage, children, education, social network- and sense of belonging aspirations. It also studies the weight given to economic independence when paired with the alternatives. The outcomes of research question one feed into research question two, where three pairs of aspirations are selected to investigate further whether peer effects in social networks influence aspirations. The results reveal whether students conform to the average aspiration levels of their friends. The third and last research question focuses on effort as an instrument that converts aspirations into behaviour. It examines how social comparison may render competitive and destructive envy, and how both types may have different effects on effort and welfare. Each research question is discussed in a separate chapter, which are described in more detail in section 1.6.

1.5. Methodology and data

The general research design followed a mixed methods approach, albeit with a strong emphasis on a positivist epistemology. Even though epistemological differences between scientific ideologies exist, sequencing research methods is considered an improvement of reliability and representativeness (Holland & Campbell, 2005). The qualitative method used is an open-ended interview approach, which was aimed at providing insights into the local meaning of aspirations and to present an overview of relevant aspirations for the research area. The results of the open-ended interviews were aimed at feeding into the quantitative data-collection instruments that elicited aspirations in a novel and innovative way. The quantitative instruments also elicited friendship ties and allowed studying effort and envy. Assistance during the data collection phase was provided by The Field Lab Uganda, which is a not-for-profit organisation that offers a network of research assistants that have ample experience with conducting qualitative and quantitative data collection in Uganda.

For the qualitative data-collection, the thesis defined youngsters as individuals between the age of 18-21 in rural Sironko, and between the age of 18-23 in urban Mbale. A lower upper age limit in Sironko was believed to be necessary to avoid sampling youngsters that were still young of age but had already accomplished life-determining outcomes like children or marriage. In the urban area this was considered less of a problem, but despite the age limit, respondents with substantial achievements in life still participated in the interviews in both Sironko and Mbale.

For the quantitative data-collection, the thesis focused on Senior six high school students only. This is done for the following reasons. First, students had not yet realised aspirations like getting marriage, getting children, or owning a business. This avoided that students justified the goals they had accomplished and decisions they had made that had shaped their current lives (the open-ended interviews already proved this was difficult to avoid). A second reason, which is related to the first, is that Senior six students are the most senior students in the Ugandan school system and were expected to have started anticipating on their future. For most students, dependency on parents or caretakers soon came to an end, and they needed to start planning for an own, independent life. Third, classrooms are delineated places in which students interact on a frequent base (e.g. self-contained networks). This created an ideal ‘space' to examine peer effects in aspirations. Students interact with each other daily, they

select their friends mainly from the classroom and focusing on classes only excluded any influence from peers that were not in school. Fourth and last, focusing on students in this study had a practical reason as it avoided illiteracy and cognitive ability issues that could have affected the understanding of the data-collection instruments.

Deciding to focus on the aspirations of high school students in a second phase instead of continuing researching the aspirations of youngsters in general (school going and non-school going adolescents), may affect the external validity of the results. Compared to the aspirations of non-school going youngsters, the aspirations of students could be based on more liberal gender norms, giving girls more room to manoeuvre and access to potential life avenues that otherwise would have been deemed unrealistic to accomplish. Moreover, school-going youngsters come from relatively wealthier families, which also provides access to opportunities which their non-school going peers do not have. Altogether, this compositional difference implies that in terms of external validity any differences that we may find between the aspirations of school-going boys and girls are underestimates of actual gender differences in the aspirations of Ugandan adolescents.

The data collection consisted of two phases of field-work and data collection. The first phase took place in the period September – November 2015 and was aimed at scoping the research area and conducting open-ended interviews of explorative nature. The interview script was tested, adjusted, and implemented and resulted in 38 interviews that provided insight into how youngsters experience trade-offs between aspirations when trying to improve their lives. At the end of the first field-work period, coding on base of the interview topics was used to identify six pairs of aspirations where the aspiration to become economically independent was paired with six alternatives in the social and educational sphere.

The second data-collection phase took place in the period June – August 2016. During this period, a questionnaire was tested and implemented that elicited the weight that students gave to the aspiration to become economically independent, relative to the six alternative aspirations. The questionnaire also included a section on socioeconomic background and a section on friendship ties. The questionnaire was self-completed at the school location during weekdays. Tablet computers were used to register and save responses. Only the friendship ties were elicited using hard-copy lists of students. Two local enumerators introduced the study to participants, explained questions if needed, and checked the completed questionnaires for anomalies. After

data collection, OLS regressions and individual-fixed effects regressions were used to analyse gender differences in weights given to economic aspirations relative to their alternatives. To estimate the peer effects, this thesis made use of instrumental variable estimation (IV/2SLS and IV/GMM).

The second data-collection phase also contained the development and implementation of a real-effort experiment to capture the effects of envy on effort. For the experiment, 50% of the students that participated in the questionnaire were invited. The experiments took place on Saturday mornings at the school location to keep interference with school activities to a minimum. The data collected was analysed using individual-fixed effects regressions.

Altogether, high school students were sampled from 11 classes in 8 different schools, of which 5 were located in Mbale town and 3 in Sironko district. From a potential sample of 650 students, 578 students participated in the study. However, due to invalid or missing values, the sample size varies per empirical chapter.

1.6. Thesis outline

Each empirical chapter discusses one of the three research questions presented in section 1.4. The chapters are written in such a manner that they fit the publication guidelines of peer-reviewed journals. The advantage is that they can be read as independent chapters without the necessity to read other parts of the thesis. Consequently, there may be some conceptual overlap between this introductory chapter and the empirical chapters, and between the research methods sections of the empirical chapters for which data is collected through the same data collection instrument.

The next chapter studies the reported trade-offs between the aspiration to obtain economic independence and six alternative aspirations that compete for time, effort and resources. This innovative conceptualisation of aspirations allows analysing gender differences in the weight that students give to economic independence relative to the importance of the six alternative aspirations. In addition, the chapter examines which of the six alternative aspirations is considered the most important competing alternative and whether boys and girls differ in this. As economic independence is considered highly relevant for economic empowerment, while the alternative

aspirations may be less optimal for escaping poverty, the presence of gender differences in economic aspirations may perpetuate gender inequalities.

The third chapter investigates how peer effects influence aspirations through social networks. For identification reasons, the chapter zooms in on the pairs of aspirations where economic independence is paired with three alternative aspirations that share a communal component. In order to deal with the reflection problem that results from simultaneity between the aspirations of friends and the individual, this chapter is the first of its kind to propose a non-overlapping peers' approach where the aspirations of friends are instrumented with the characteristics of friends of friends who are not the friends of the individual. The existence of any peer effects emphasises the relevance of spill-over effects, which can be beneficial to economic empowerment programmes.

The fourth chapter moves from aspirations to actual behaviour and examines the effect of envy on effort. Envy is divided into two types: one type that increases effort, and one type that decreases effort. The chapter implements a real-effort experiment and investigates whether participants are affected by relative performance feedback, the threat of money-burning, or a combination of both. The innovative design of the experiment allows disentangling the effects of both types of envy. The existence of competitive- and destructive envy effects on effort is relevant for policies that aim to increase the production of the poor through exposure to successful peers.

The fifth and last chapter concludes and answers the three research questions. It also highlights the contribution each independent chapter makes to the existing literature and elaborates on their relevance for development policy. The chapter ends with acknowledging the limitations of the study and proposes ideas for future research on aspirations.

Chapter 2. Gendered aspirations of high school students in Uganda

Abstract

Women's economic empowerment provides an important pathway to increase gender equality and tackle poverty. Gender norms, however, may pose an important constraint on economic aspirations of girls in developing countries. This study examines gender differences in aspirations of high school students in eastern Uganda. We elicit the economic aspirations as well as six competing aspirations in the social and educational spheres of 572 Ugandan high school students. We find that boys and girls aspire to economic independence over most alternatives, apart from education. However, girls compared to boys attach a lower value to economic aspirations relative to five of six alternative aspirations. Looking at the weight given among the different alternative aspirations, girls have a relatively stronger preference for aspirations like community engagement and education, while boys have a relatively stronger preference for living in peace with relatives. These gendered aspirations suggest an important mechanism by which gender inequality in the economic sphere is perpetuated.

Keywords: aspirations, youth, gender, economic empowerment.

2.1. Introduction

Over the last decade, most developing countries have implemented policies to reduce gender inequalities. Nevertheless, the most recent Human Development Report (Nations, 2017) indicates that in more than 100 countries, women are still primarily discriminated against, and they often end up in a marginalised position. The origins of gender inequality are deeply embedded in dominant social norms that define gender roles and associated behaviour, favouring men over women. Such norms are intergenerationally transmitted, and young people replicate social norms that fit their prescribed gender roles, internalising and perpetuating gender inequalities by starting to aspire accordingly (Harper, Marcus, & Moore, 2003).

The economic aspirations of women are largely affected by this. Women who have full control over their economic activities play a fundamental role in development and poverty reduction, and women's economic empowerment could improve the health, education, and nutrition of their children, amongst other dimensions (Duflo,

2003, 2012; Quisumbing & Maluccio, 2000). For women, starting a small-scale business is often considered a gateway to increased economic empowerment (Richardson, Howarth, & Finnegan, 2004). Nevertheless, women have lower entrepreneurial and income aspirations compared to men, and in combination with limited time and resources available, the performance of women-owned businesses is lower and significantly less profitable than those owned by men (Dalton, Ruschenpohler, & Zia, 2018; Jamali, 2009).

In this paper, we hypothesise that, because of internalised gender norms, women's economic aspirations strongly compete with aspirations in alternative domains that society considers more appropriate for them. This could constrain women's economic aspirations and perpetuate low standards of living for women in particular. An analysis of the aspirations of boys and girls in the economic, social and educational spheres can expand our understanding, which is the main contribution of this paper. For this purpose, we interviewed boys and girls in Uganda on their aspirations and the competition they experience between them. We then identified six main alternative aspirations in the social and educational domains with which economic aspirations might compete. In a next step, we paired these aspirations in a questionnaire to elicit the aspirations of a sample of 572 high school students.

Our results can be summarised as follows. When comparing aspirations between boys and girls, we find important gender differences. Apart from education, both gender groups aspire to economic independence over most of its alternatives, but boys cast a stronger preference for economic independence than girls do. Girls also aspire to economic independence more than most of its alternatives but attach more value to competing alternatives like marriage, childbearing, community engagement, the proximity of family and friends, and higher education than boys.

Our study contributes to two strands of literature. First, it adds to research on interventions aimed at raising girls' economic empowerment. Interventions that include vocational training only have resulted in low and short-term gains (McKenzie, 2017), while sex-based education and soft skills programmes have mixed results (Dupas, 2011; Groh, Krishnan, McKenzie, & Vishwanath, 2012). Bandiera et al. (2017) demonstrate that successful economic empowerment interventions that target girls living in poverty need to combine the technical skills of running a business or employment-related skills training with addressing internal constraints like low self-confidence and low economic aspirations.

This study also relates to a large number of studies that demonstrate that gender-specific aspirations are rooted mainly in social and economic context, reproduced via three mechanisms. First, adolescents are likely to mirror their parents' aspirations, which frequently leads to gender differences in aspirations (Beaman et al., 2012; Dercon & Singh, 2013). Second, aspirations are transmitted through peers with similar backgrounds (Bernard et al., 2014; Macours & Vakis, 2014), and third, the socioeconomic context largely determines the resources available to young people. They determine what youngsters consider realistic and attainable when trying to improve their lives, and this could, in turn, influence their aspirations. All three mechanisms create significant differences in the aspirations of boys and girls in developing countries, with women often having lower aspirations than men as shown in studies by Bloem, Boughton, Htoo, Hein, and Payongayong (2017) on land and income aspirations, Dalton et al. (2018) on business aspirations, Bernard et al. (2014) on status, wealth and income aspirations, and Mukherjee (2015) on educational aspirations.

However, the two strands of literature pay minimal attention to the multidimensional character of aspirations and the interdependency between them, which is especially relevant for adolescents growing up in poverty. Due to a lack of resources, they are forced to trade off their aspirations when trying to better their lives. Apart from Bernard and Taffesse (2014) and Kosec, Hameed, and Hausladen (2012), who both use a survey instrument to capture a number of aspirational dimensions in Ethiopia and Pakistan and the weight attached to each dimension, no study has looked at how the poor trade off their aspirations, and whether boys and girls do so differently.

In the remainder of this paper, we present a conceptual framework that reflects on the interdependency adolescents perceive between economic aspirations and competing aspirations in the social and educational domains. It also conceptualises why boys and girls may trade off economic aspirations with competing aspirations differently. An elaboration on the research methods then follows in a third section, together with an explanation of how we make aspirations context-specific to the research area. We present the empirical results in a fourth section, followed by a discussion of the most important results and their relevance for development policy. A final section concludes.

2.2. Trading off aspirations

Youngsters growing up in poverty need to make complex decisions when trying to better their lives. Due to their poverty, their aspirations are mutual substitutes, competing with one another for time, effort and scarce resources. As aspirations are interlinked, deciding how to advance in life involves a context-specific process of trading off aspirations. In this section, we first describe economic, social and educational aspirations, after which we discuss the trade-offs between economic aspirations and competing aspirations in the social and educational spheres, and how boys and girls may aspire to them differently.

2.2.1. Multidimensional aspirations

The economic aspirations of the poor have always played a central role in development and poverty reduction. Due to a lack of formal employment, entrepreneurship among young people is widely promoted in sub-Saharan Africa (Garcia & Jean, 2008), and various studies emphasise the role of economic aspirations among the poor. Kosec et al. (2012), who study aspirations in Pakistan, find that participants give income aspirations most weight when asked to decide on the importance of income, assets, education, and social status. In addition, a number of studies (Camfield, Masae, McGregor, & Promphaking, 2013; Nguyen, Moschis, & Shannon, 2009) suggest that young people in developing countries increasingly attach value to symbols of modernity and acquire materialistic values, adding to their sense of belonging to a modern society and opposing the idea of being considered ‘undeveloped’.

Aspirations in the social dimension mainly relate to establishing, sustaining, and improving social relationships with others. In developing countries, traditional values regularly emphasise the importance of children and marriage, peaceful family relations, and a sense of community. Social status is determined mainly by parenthood and marriage (Caldwell & Caldwell, 1987), and family and community engagement remain vital for social inclusion, access to social and financial capital, and help to recover from shocks. In their study on mapping multidimensional aspirations in Peru, Thailand, and Bangladesh, Copestake and Camfield (2010) demonstrate that aspiring to keep good family relations is still reported as one of the most ‘needed’ aspirations for a good life, while childbearing scores relatively high as well.

A third dimension touches on the relevance of education. The increasing importance of education among young people is mainly the result of the growing access to education, which has steadily increased tertiary school enrolment in sub-Saharan Africa. The educational aspirations of young people are driven by prospects of better job opportunities, higher salaries (Bloom, Canning, & Chan, 2006) but also social status, influence, and personal satisfaction from being highly educated (Johnstone, 2004).

2.2.2. Competing dimensions

In this section, we discuss how young people trade off economic aspirations with aspirations in the social and educational spheres, and how this may differ between boys and girls. We focus on economic aspirations because we are interested in women's economic empowerment. Due to traditional gender roles that define the notion of femininity and masculinity and corresponding behaviour, boys and girls may aspire to certain domains that come at the expense of their economic aspirations.

Table 1 structures the competition between dimensions and shows how aspirations compete differently per gender group. From the literature, we distil two mechanisms that might make girls attach a stronger weight to the social dimension than boys when trading off the economic dimension with the social dimension. The first mechanism refers to starting a family (the numbers (1) and (2) in Table 1). For girls, economic independence reduces vulnerability by being able to access food, health, and social networks (Duflo, 2012). It can also decrease girls' dependency on older men, which decreases vulnerability to HIV/AIDS and protects them against coerced sex and transactional sex (Bruce & Hallman, 2008). On the other hand, the social status of girls depends primarily on motherhood and marriage (Mason, 2001). Also, being taken care of at later life is considered a motivation stronger for girls than for boys to have many children (Caldwell & Caldwell, 1987). Marriage can also be a tool to reduce vulnerability and economic hardship, and it lowers a financial burden from their parental household. However, during marriage and childbearing girls experience a direct negative impact on their income generating activities (Aldaz-Carroll & Morán, 2001; Cáceres-Delpiano, 2012). Household chores can consume time and effort, and in many developing countries, spouses restrict their wives' mobility and economic activities. Even though girls in developing countries are

increasingly postponing marriage and childbearing to participate in the labour market (Shapiro & Gebreselassie, 2014), girls may still internalise traditional gender norms, aspire to what they consider is socially appropriate, and sacrifice critical levels of their economic freedom to attain their social aspirations. This mechanism identifies the relation between both dimensions as 'conflicting' for girls.

Table 1. Trading off the economic dimension

	Girls	Boys
	Economic dimension	
Social dimension (children/marriage)	▪ Conflicting: Children and marriage provide status as a mother and a wife, but strongly limit income-generating opportunities for young women and vice versa. Employment reduces dependency on men and increases agency. (1)	▪ Complementary: Children and marriage provide status as 'man' but demand substantial economic resources (being a 'provider' is elementary for masculinity). Alternatively, economic success needed to advance reputation. (2)
Social dimension (social capital)	▪ Complementary: Social networks provide socioeconomic safety and a rare opportunity to build social capital that stimulates information exchange, decision-making power and economic success. But building social networks is costly and strongly limits the time available for employment. (3)	▪ Conflicting: Social networks provide socioeconomic safety, but also come with firm pressure to share economic success. Not contributing can have severe social repercussions and social exclusion. Social capital is less scarce, and it does not outweigh the cost of maintaining social networks (4).
Educational dimension	▪ Complementary: Economic independence reduces dependency on family/spouse, but without education, unskilled labour has low benefits for girls: education qualifies girls for more beneficial employment but means extended dependence on others. (5)	▪ Conflicting: Education leads to better economic opportunities in the future but requires economic sacrifices. Generating income reflects social expectations of boys and having a stable source of income can be a safer investment for boys in the short term. (6)

For boys (see number (2) of Table 1), economic independence leads to power and autonomy, advancing their masculinity (Barker & Ricardo, 2005). The reputation of young men also increases through children and marriage, but starting a nuclear family requires them to possess resources that pay for a bride price, find and pay for lodging, and cater for children and wife. In Uganda, being a 'provider' is, therefore, a defining element of a man's masculinity (Adams, Salazar, & Lundgren, 2013; Heald, 1998). Townsend (1997) demonstrates that such financial burden lowers the appeal of the social dimension for young men in Botswana. As a consequence, boys marry at a later age than girls, and the percentage of boys between the age 20-24 currently married is much lower (16%) than girls (32%) in Uganda (Uganda Bureau of Statistics, 2018b). Therefore, the economic dimension is 'complementary' to the social dimension for boys in this mechanism.

A second mechanism that shows how boys and girls may trade off the economic and social dimensions differently addresses the importance of social networks in traditional societies where egalitarian norms prevail. A wide strand of literature (Chantarat & Barrett, 2012; Fafchamps, 2006; Fafchamps & Minten, 2002; Woolcock & Narayan, 2000) demonstrates that participation in social networks is essential for survival, providing the poor access to resources, social security, and friendship. However, building and maintaining social networks is costly.

In Table 1, number (3) describes what this second mechanism means for girls, and claims that girls depend more on spouses and family than boys (Barker & Ricardo, 2005). Girls have limited access to economic opportunities and are sometimes even prohibited from engaging in them. Therefore, involvement in family-transcending social networks provides a subtle opportunity to build social capital outside the household, share information and awareness on rights (Alemu, Van Kempen, & Ruben, 2018). These outcomes could fuel entrepreneurial success and economic opportunity, making both dimensions complementary in this mechanism. Even though building and maintaining social networks requires time and resources (Dasgupta, 2005), economic opportunities are limited for girls. Therefore, girls may aspire to building social networks more than to their economic independence.

Boys, on the other hand, are more and more socialised as providers and pressured to contribute and share with kin. This is especially the case in times of economic success. Barr and Stein (2008), for example, show that Zimbabwean households with higher income are considered to violate the egalitarian norm, and

frequently face sanctions. Richards (2005) and White (2012), however, provide evidence that boys face various difficulties in their endeavours to generate an income, like limited productive opportunities in rural societies with strong gerontocratic structures. Consequently, young men may be inclined to shy away from their social obligations and aspire to keep economic proceeds to themselves instead. The description in (4) in Table 1 concludes that in this mechanism both dimensions are conflicting for boys.

The literature also suggests a difference between boys and girls when trading off the economic dimension with the education dimension, which is best demonstrated by the economic sacrifices that need to be made to obtain higher education. Even though school enrolment has increased over the past decades, tuition fees, low quality of education and lack of employment opportunities still pressure young people to consider unskilled labour or running small businesses as alternative livelihoods.

For girls, unskilled labour is a less attractive alternative, having lower benefits for them than for boys (Aldaz-Carroll & Morán, 2001). Education, on the other hand, has clear-cut benefits for girls, and can eventually qualify them for a type of employment like administrative and service jobs that is more beneficial to them (Duflo, 2012). Therefore, number (5) outlines that girls that have the opportunity to access education may be more inclined to aspire to obtain a degree as an alternative trajectory than boys, accepting the cost of remaining dependent on others. It also implies that for them, education is complementary to economic success.

Barker and Ricardo (2005) claim that social expectations require young men to provide income, while Blum (2007) states it may eventually outweigh education as a more reliable investment for their future, forming argument (6) in Table 1. Favara (2017) shows that the pressure on boys to drop out of school and earn money grows with their ability to contribute to the household. Especially boys that work on the family farm or already have a form of income are more likely to drop out. As the economic sacrifices of education are significant, education and economic independence are then conflicting aspirations for boys.

In sum, boys and girls face trade-offs between the economic sphere and the social and educational sphere. Social aspirations like marriage, childbearing, and building and maintaining social networks influence the ability to become economically successful and autonomous. Moreover, also the educational dimension competes with the economic dimension for time, resources, and effort. For girls, aspiring to being part

of social networks and obtaining higher education can potentially be complementary to economic independence and a more subtle way of acquiring levels of economic empowerment, whereas marriage and fertility are mainly restraining. Altogether, we expect boys and girls to trade off the economic dimension and its alternatives differently, creating gender differences in aspirations.

2.3. Research methods

Our research design includes both a qualitative and quantitative instrument. In November 2015, we started with 38 semi-structured interviews to identify the relevant aspirations of adolescents in the greater Mbale area in Uganda. The interviews provided insight into how boys and girls trade-off aspirations differently in their endeavours to become economically independent. The interviews also allowed us to design a survey instrument to elicit individual aspirations in the economic, social and educational dimensions, which we used in the subsequent quantitative phase of the study.

2.3.1. Interviews

We recruited boys and girls from the rural Sironko district and urban Mbale district in Uganda using a snowball sample approach. In Sironko, we randomly sampled two villages, and in each village the local council chairperson (LC1) was approached who proposed a number of differing adolescents to start the interviews with. In Mbale town, a key mobiliser composed a diverse first group of adolescents (university, workshops/garages, shops, etc.) who were willing to take part in the study. They were then asked to suggest new participants, who were invited to come to the school or townhall the day after. Therefore, the 38 participants form the complete census of the snowball sampling, and they were not randomly sampled from a larger set of adolescents. We did not limit our sample to high school students to obtain a broader perspective of relevant aspirations and a better understanding of the social context in which the aspirations of high school students were situated.

We realise that a snowball sampling technique can lead to a homogeneous sample that may not necessarily represents the research area. Therefore, we used an initial stratified sample along the rural/urban dimension and aimed to start the snowball

sample approach with a preselected group of adolescents differing on the characteristics gender, age, and school enrolment. Table 2 presents a descriptive overview of the final sample that resulted from the snowball sampling technique.

Table 2. Socioeconomic descriptives of participants semi-structured interviews

	Pooled	Boys	Girls
Female	50%		
Urban	50%	47%	53%
Age	19.89	19.95	19.84
Married / cohabitation	11%	5%	16%
Religion			
Catholic	55%	47%	63%
Protestant	32%	32%	32%
Other	13%	21%	5%
Gisu tribe	89%	95%	83%
Household members	6.52	6.32	6.74
Children	0.29	0.11	0.47
Highest education level finished			
Primary (not finished)	29%	37%	21%
Primary	34%	32%	37%
Secondary	37%	32%	42%
Income generation			
Study	26%	0%	53%
Agriculture / cattle	34%	53%	16%
Urban labour	21%	37%	5%
Other (small business, reliance on spouse, etc.)	16%	11%	26%
Observations	38	19	19

Because of our stratified sampling approach along the urban/rural dimension, half of the 38 participants were located in rural Sironko, while the other half was based in urban Mbale. Moreover, we aimed at including an equal number of women as men, hence why half of the respondents is female. We used as age limits a minimum of 18 years and maximum of 21 years in Sironko. In Mbale we used a maximum age limit of 23 years. Half of the participants identified as Catholic, which is probably the result of randomly sampling two villages in Sironko that were predominantly Catholic. Respondents were also largely uniform in ethnic background, as almost all of them identified as belonging to the Gisu tribe. In our sample, six girls and two boys already

had children. What further stands out is that more girls than boys were already married or living in cohabitation. Also, all participants have been enrolled in primary school or higher, and the percentages suggest that the girls interviewed are higher educated than the boys. None of the boys were still in school at the time of the interview, in contrast to the girls, and they indicated that they generated an income mainly through agricultural activities or urban labour (e.g. bricklayer, car mechanic, etc.). In sum, the descriptives in Table 2 demonstrate that although a snowball sampling technique can lead to a uniform sample as respondents may refer to similar, like-minded respondents, our sample of 38 participants is relatively diverse in terms of religious, educational, and income generating background.

The script of the semi-structured interviews included questions on their perception of aspirations as a social construct (e.g. linguistic expressions, descriptions and meaning), after which interviewees were presented fourteen cards containing short but general descriptions of various aspirations like getting married, getting a stable income, building an own house, being well-regarded by family and friends. They were written down in English and Lugisu, the local language in the research area, and laid out on the interview table for participants to read them. These cards aimed to avoid a discussion of *short-term* goals like planting coffee or buying a motorcycle and induce the participants into thinking about realistic *long-term* aspirations. Participants were not bound to the aspirations on the cards and could also mention other aspirations.

In a second section, participants were then asked 1) which of the aspirations were relevant to them, and 2) which aspirations competed with each other. They were asked to elaborate on their choices.[1] The aspirations chosen had to be future-oriented (i.e. not yet attained), realistically possible, and attainable through their effort. The interviews were conducted using local enumerators: a female enumerator for female participants, and a male enumerator for male participants. The interviews took approximately 80 minutes and were held in private in either a school building or town hall.[2] The interview notes were analysed using a topic list that contained a priori codes

[1] Participants were also asked which aspirations were instrumental to one another in a third and final part of the interview. The results are not included here, as the answers contained a platitude of complex, hypothetical pathways through which aspirations were linked to one another.

[2] For privacy reasons, interviewing at home was not allowed as it could have biased the results. A school or townhall as interview location was considered the most neutral location available.

on which also the interview script was based.[3] The script of the interviews can be found in Appendix A.2.

2.3.2. Survey

The interviews brought forward a set of six competing aspirations to economic independence. We paired the aspiration to become economically independent with each of the six competing aspirations and moulded the pairs into constant sum paired comparisons which we then put in a survey format. In our survey approach, we requested respondents to rate the direction and intensity of their preference by allocating ten tokens over the two alternatives in one pair. As a result, responses provided information on the respondents' strength of preference. Importantly, the allocation of tokens allowed respondents to indicate one alternative as the better of two aspirations, even when both are considered suitable choices. The allocation of tokens uses a rating scale that is similar to a Likert scale but does not assign ordinal labels. The scale includes 11 answer categories ranging from 0 to 10. De Beuckelaer, Toonen, and Davidov (2013) demonstrate that for contingent valuation, 11-point Likert scale ensures best measurement validity and avoids transitivity errors. We also captured the extent to which participants considered paired aspirations as *competing*. This entailed the degree to which the pairs are deemed relevant trade-offs for both gender groups. For this, we used a 5-point Likert scale with ordinal labels, ranging from fully agree (5), to fully disagree (1).

In our survey, we focused on sixth form high school students for two reasons. First, sixth form students are the most senior students in the Ugandan high school system and were expected to contemplate already on long-term, future-impacting life decisions, soon experiencing competing aspirations in real-life as dependency on parents comes to a close. Second, high school students have not yet attained life-compelling achievements like marriage, full-time employment, or a graduate's degree,

[3] Interviews were not recorded and transcribed, as most of them were conducted in a mix of English and Lugisu. Per topic, the enumerators made notes based on what they considered relevant quotes and stories. The quotes of interviewees used in this paper are, therefore, the product of the translation of the enumerators, and should be interpreted as such.

in contrast to many of their non-school going peers. This eliminates potential justification of decisions adolescents made in the past that could bias survey responses.

We randomly sampled at the class level. For the sample frame, we used a list of all high school classes in Mbale District and Sironko district, compiled by the municipality offices in both locations (but based on the data the schools provide to them).[4] All students within classes sampled were invited to participate, leading to a potential sample of 650 students divided over eleven classes and eight schools; five classes in five schools in Mbale District, and six classes in three schools in Sironko District.

We tested the description of pairs, wording of questioning, and response categories with adolescents at non-sampled schools in both urban and rural locations before presenting them to our participants. Detailed descriptions of the paired aspirations and the corresponding survey questions are presented in Appendix A.4.

For each pair, the questionnaire in the appendix first provides a short description of each of the two aspirations paired. These descriptions are based on the results of the semi-structured interviews and refer to the accomplishments and benefits when an aspiration is attained. After the two descriptions, a statement follows that indicates that the attainment of both aspirations at the same time is not possible and explains why they conflict with each other. Respondents are then asked to indicate the extent to which they agree with that statement (i.e. the extent to which they conflict or not), after which they are asked to distribute ten tokens over the two aspirations paired. The distribution of the tokens reflects the importance of each of the two aspirations and indicates whether one aspiration is preferred over the other or whether they are valued equally.

Over the period July-August 2016, 572 students participated in the study. The aspirations of students and their socioeconomic characteristics were elicited at the school location with the help of tablet computers. Respondents self-completed the

[4] Initially, the study aimed to include only classes with a minimum of 30 students, but in reality, this appeared to be difficult. In general, student enrolment in Uganda is highly volatile as students face various challenges like raising tuition fees or (family) sickness, forcing them to drop out. Also, many schools register students manually and in writing, resulting in erroneous student records. Only after approaching schools, we discovered that actual enrolment numbers were often lower than mentioned in official records, and we, therefore, decided to continue our study with classes that we already had sampled.

questionnaire individually. To keep oversight on data collection, a maximum of six participants completed the questionnaire at the same time in the interview room. After completion, a new participant was invited, although participants' group size could not exceed six. Questions were stated in English, which is also the official language at the schools selected, and participants took approximately 90 minutes to complete the questionnaire. Two local enumerators were present to provide instructions and to help participants with any queries regarding the questionnaire and tablet computer. On the tablets, visual aids were used to make filling out the questionnaire easier. For example, questions belonging to similar components (e.g. socioeconomic background, paired aspirations) were put together on one screen. After completing a component, the screen coloured green indicating all questions had been answered. Once a respondent completed the entire questionnaire, an enumerator checked responses to eliminate any invalid answers (e.g. typos) before submitting the survey to an online storage platform.

2.4. Results

2.4.1. Interviews; economic independence and six competing alternatives

In this section, we elaborate on how the interviewees define the economic dimension, the motives for aspiring to it and its contribution to a better life, and how boys and girls experience competitive pressure from other aspirations. We start with a short description of how the respondents describe aspirations in their own words during the semi-structured interviews. In Lugisu, which is the dominant language of the Bagisu tribe in the greater Mbale area, the word aspiration does not have a direct translation. Aspirations are described as *'byambaaso bye muutu byemumaaso bysi asibilirwa kurfuna'* and *'bintu byesi usubila kukola mumaaso'*. The first description can be translated as someone's future plans that one intends to achieve, whereas the second description refers to things that you intend to do in the future. Both expressions relate to the intention to achieve a certain outcome in the future. Other words related to aspirations that were mentioned during the interviews are *'bisubiro', bisubizo'* and *'byambaaso'*, which refer to expectations, promises (i.e. potential or possibilities), and

thoughts, respectively. Also, the notion of planning (*'kupanga'*) and thoughts and ideas to a better (financial) situation (*'imbela'*) were mentioned.[5]

A close reading of the 38 semi-structured interviews with youngsters between 18 and 23 years old yields a comprehensive perspective on the different aspirations and interpretations of the boys and girls living in rural Sironko and urban Mbale.[6] The youngsters are well able to indicate what is realistically achievable in their current life situation, and also what is not; they do not aspire to dimensions they deem unrealistic to accomplish in the next five years. We use a five-year limit to make aspirations more realistic and to distinguish between aspirations and more general wishes or desires. Regarding what sets possibilities and what is considered realistic, however, girls point out that men have a strong influence on the aspirations of girls. On the base of what they deem appropriate, men determine the boundaries of what girls are allowed to do, which then defines what girls perceive as realistically achievable. We do not make a distinction between Mbale and Sironko when presenting the interview results as they do not reveal substantial differences between locations.

Economic aspirations are given considerable importance and are broken down into income, ownership, and wealth. These terms are used interchangeably by the interviewees. The most popular route mentioned for attaining economic aspirations is setting up a business ('shop' or 'trading'). An 18-year-old girl states that *"In Uganda today jobs are limited. So, if you have no business of your own you can die of poverty, even after going to school"* (participant U1, personal communication, November 12, 2015). A 20-year-old girl from rural Butaleja but now living in Mbale describes the steps that should lead to opening her clothing shop;

[5] In May 2015, seven focus group discussions in the Budadiri area in Sironko were organised where participants discussed the meaning of aspirations and the characteristics that define them. The design of the focus group discussions and short analysis of the responses that lead to a context-specific characterisation of aspirations are presented in Appendix A.1. The aim of the focus group discussions was mainly to get familiar with the research area and to provide input for the design of the data collection instruments. The linguistic expressions in the appendix are in the Budadiri dialect (*Ludadiri*).

[6] A complete list of interviewees by age, gender, location and date of interview is attached in Appendix A.3.

> *Starting a business for lady clothes will help me to become financially independent and also improve my standard of living. Through hard work, I think it is achievable because I already started making mandazi, popcorns and crisps. If I continue saving for my project, in the future, I am sure I will open a boutique shop. I will also get a fridge and make juice for people, and I will continue selling food* (participant U9, personal communication, November 14, 2015).

A small-scale business can be started without any form of education and contributes more to status than farming. A 21-year-old boy in rural Sironko indicates that *"With a business, you will be known everywhere. You can borrow money and you are feared" (*participant R17, personal communication, November 10, 2015*)*. Farming is considered a start-up option which feeds into setting up a business, or functions as a backup option in case business attempts fail. Obviously, owning a business is believed to yield more independence than working for someone else.

Boys and girls explain that their aspiration to start a business is primarily based on independence, gaining responsibility, autonomy, and being able to take care of others. A 20-year-old boy from rural Busiu but based in Mbale says that *"I want to start a business to be self-employed and to make money, to take care of my family, and to show a sign of maturity"* (participant U12, personal communication, November 14, 2015). A 21-year-old Sironko based girl emphasises that when doing economically well *"People within the community run to you for support and advice" (*participant R16, personal communication, November 9, 2015*)*. Others argue that independence is not always desirable as it demands a social sacrifice: "*It also changes your behaviour, you become more tough" (*participant U6, personal communication, November 13, 2015*).*

Boys and girls report aspiring to similar alternatives that compete with the aspiration to become economically independent. In random order, the interviews mention competing pressures from marriage, childbearing, community engagement, living near family and friends, peaceful relations with kin and obtaining higher

education. In the next section, the aspiration to each of these alternatives is shortly explained, and their trade-off with economic independence discussed.

Boys and girls report marriage as a competing alternative. To marry is considered obeying social and religious norms and doing what is expected of young people. A 19-year-old girl from rural Busulani states that *"If you are not married, people mock you"* (participant R9, personal communication, November 7, 2015*)* and a 19-year-old boy from neighbouring Buyobo adds that marriage *"gives you respect and maturity"* (participant R13, personal communication, November 9, 2015*)*. It is also considered an assurance of social security and support, which explains why girls are believed to frequently marry older men. However, once married, girls are often not allowed to work or are expected to do domestic work, limiting the possibility to spend time and effort on own employment. A 20-year-old girl from Mbale explains:

> *It will block some of my aspirations. Like, if I marry now, the man might control me, and I would fail to become independent in my life. Some men do not want working women. So, I will be struggling to make him happy at the cost of my aspirations* (participant U9, personal communication, November 14, 2015).

Without contributing financially, girls' decision-making power in the household declines, while dependency on spouses increases largely. Boys, on the other hand, report they need to be financially 'established' before they can marry, being able to take over the responsibilities of the girl's family. A 19-year-old boy from rural Busulani states that "*Getting a wife needs that you have prepared yourself"* (participant R2, personal communication, November 5, 2015) and another boy sums up what it means to be prepared "*By starting a business or getting employed, by constructing an own house, and by behaving responsible"* (participant U16, personal communication, November 16, 2015). Marriage also demands a bride price. Boys often do not have those resources available and trying to obtain them could interfere with their economic endeavours.

Connected to marriage is the aspiration of getting children. Like marriage, childbearing provides social status, and taking care of children creates an image

towards the community that the parents are responsible individuals. Children are also expected to take care of the parents at an older age. A 19-year-old Mbale based boy states that *"In our tradition, having a wife and children is a sign of respect and maturity. They will help me in my old age, and provide labour"* (participant U4, personal communication, November 12, 2015). However, boys and girls are aware of the implications of childbearing on economic aspirations. Girls report they do not just want to 'produce' and indicate that their economic activities are likely to be strained by the children they anticipate having. Consequently, girls mention that they prefer having children when they feel they have accumulated income that functions as personal, financial buffer. An 18-year-old girl from Buyobo says that *"When you start up a business, and this business copes, and you are sure there is a reliable income, only then you can produce children. Because you are sure you can care for them"* (participant R14, personal communication, November 9, 2015). Boys also mention competing pressure of children on economic independence. However, they express a strong preference for raising children and seem not to worry about the cost of upbringing. At the same time, boys indicate that the Gishu tradition of giving land can be costly with many children. A 21-year-old farmer from rural Busulani provides an example:

> *Once you give your children land, you cannot go to their plantation to cut matoke. It no longer belongs to you. They can only do you a favour by giving you some matoke if they wish, but you have no right to cut it from their garden* (participant R10, personal communication, November 7, 2015).

Aspiring to becoming an active communal person bears practical and political relevance. Boys and girls aspire to engage in collective groups, as not participating excludes them from being allowed to take part in communal agricultural programmes or community-based NGO programmes. It also provides access to social safety networks. In that regard, the interviewees portray community engagement as a classical form of social capital, providing access to resources and support. An 18-year-old girl from Busulani states *"When you are not active, you will be excluded from*

future projects, which often have agricultural benefits. The NGOs that come here only deal with groups" (participant R5, personal communication, November 6, 2015). Moreover, community engagement also contributes to building a personal reputation and allows access to decision making. However, community participation is considered demanding, time-consuming, sometimes 'a waste of time', without tangible benefits in the short-term, and takes its toll on the effort, time and resources that could otherwise have been invested in agricultural or business activities.

Boys and girls also aspire to have peaceful relations with relatives, which, at the same time, is deemed a double-edged sword; on the one hand family helps out by offering support, but on the other hand, participants indicate that strong family ties can lead to jealousy, envy, and demand for sharing income when doing well. Interviewees mention that they aspire to be respected by family members for doing well, but also like to keep them at a distance to avoid being affected by them. Some interviewees even fear being harmed or killed in case of economic success. This goes together with a general belief in spiritually and witchcraft, which can only be exercised by close relatives. Envy is then a frequent motive to instigate such rituals. A 19-year-old girl from Busulani explains how jealousy, also known as '*fitiina'* in the local language, takes shape in practice:

> *Close family and friends can turn against you. If you accumulate wealth and you have your own business, you can bring family together in there. But they will steal from you and plan against you, plan your death* (participant R9, personal communication, November 7, 2015).

Living near family and friends is a related aspiration that is based on socioeconomic security, which also provides knowledge and labour when setting up labour-intensive economic activities like farming and animal husbandry. However, the family is also believed to be a burden to any personal development and the ability to think and plan for the future. Living near family hinders exposure to new ideas, which is perceived relevant for prospering economically. A 19-year-old boy from rural Buyobo explains: *"The people you have lived with do not give you any new ideas, so you have to go far in order to learn new ideas. You will never develop and meet your goals"* (participant

R13, personal communication, November 9, 2015). Moreover, local migration is sometimes deemed necessary to keep family members out of economic activities and the household. According to another 19-year-old boy, "*Family and friends will keep on eating the small business that you have. When they borrow, they do not pay back normally. They are your family, and in the end, your shop can collapse"* (participant R12, personal communication, November 7, 2015). When deciding to migrate, the interviewees explain they cannot just return to their communities in case of economic failure. They prefer to stay at their new location, even if that means lethargy.

Moreover, obtaining higher education is a popular aspiration and boys and girls consider it the main gateway to a better life. Acquiring skills and knowledge are deemed essential in securing an office job or starting a successful business. In many cases, however, the family only pays tuition fees for the first couple of years, and most interviewees indicate they have to pay fees themselves, emphasising the necessity of finding work that generates sufficient income. Therefore, it is not unusual to take a break from school to collect money for fees and save money to create a financial buffer while being at school. Eventually, the individual needs to stop working to go back to school. A 20-year-old Mbale based girl states that:

> *I cannot be at school and concentrate on starting an own business like a boutique. I intend to start my business, make an income, and then later will use the profits to pursue an education. I will not even have time to run my business then. School needs commitment* (participant U9, personal communication, November 14, 2015).

The dilemma that adolescents often face is whether they still see the necessity to go back to school. Going back means financial instability, funds saved may be used for other purposes, and former students may get accustomed to life with a relatively low but stable income and no educational obligations.

2.4.2. Descriptive statistics of socioeconomic characteristics

In this section, we present the descriptives of the socioeconomic characteristics of the participants in our sample. Complete data are available for 572 Ugandan high school students, and basic descriptive statistics are shown in Table 3. 245 students (43%) live in the rural Sironko district and 337 students (57%) in the urban Mbale district. The sample consists of 359 boys (63%), and 213 girls (37%),

Table 3. Descriptives of socioeconomic characteristics

Variables	Pooled	Boys	Girls	Mean Difference
Urban location (Mbale)	57%	51%	68%	-0.17***
				(0.042)
Household wealth index (PCA)	0.00	0.12	-0.21	0.33
	(2.54)	(2.62)	(2.41)	(0.218)
Locus of control index (PCA)	0.00	-0.11	0.19	-0.30***
	(1.26)	(1.31)	(1.16)	(0.108)
Birth order	3.77	3.60	4.04	-0.43*
	(2.80)	(2.71)	(2.94)	(0.242)
Religiosity (monthly participation in religious events)	4.92	4.64	5.39	-0.75
	(5.46)	(5.31)	(5.63)	(0.471)
Father enrolled in secondary education or higher	50%	49%	53%	-0.04
				(0.043)
Mother enrolled in secondary education or higher	40%	37%	44%	-0.07*
				(0.042)
Father farming most important income activity	32%	35%	28%	0.06
				(0.040)
Father business most important income activity	19%	17%	22%	-0.05
				(0.034)
Mother farming most important income activity	34%	37%	28%	0.09**
				(0.041)
Mother business most important income activity	16%	12%	24%	-0.12***
				(0.032)
N	572	359	213	572

Notes. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard deviation in parentheses. For two-sided t-test, standard error in parentheses.

The household wealth index we use follows the approach suggested by Filmer and Pritchett (2001). They propose a linear index that proxies for household wealth, using asset ownership indicators and principal component analysis (PCA). To calculate our wealth index, we use the first factor of a PCA for which we use a set of assets we elicited information on through our questionnaire.[7] Additionally, the locus of control index measures self-efficacy and is based on an instrument designed initially by Rotter, Liverant, and Crowne (1961). As both characteristics are indexed, pooled scores are not discussed. [8]

On average, students have a relatively high birth order. Half of the students indicate their fathers have been enrolled in secondary education or higher, whereas also a substantial number of students reveal that their mothers have been enrolled in secondary education or higher. The most important income generating activity of both parents is farming (including livestock herding). Students attend religious services approximately once every week. Girls attend more often than boys, but the difference is not statistically significant.

The results of the two-sample t-tests in the last column of Table 3 reveal gender differences in a number of socioeconomic characteristics. First, the girls' sample is predominantly made up of urban students, whereas the boys' sample is more equally compiled. Also, girls have a statistically significantly higher birth order than boys and they also feel statistically significantly more in control of their lives than boys. A more substantial proportion of girls than boys have mothers who have been enrolled in secondary education or higher, as evidenced by a difference of 7%. Moreover, a statistically significantly larger proportion of boys than girls has a mother for whom farming is the most important income generating activity, while a statistically

[7] The wealth index includes the following items: an independent house, walls of burned bricks with cements, floors of cement, a private water connection, a private flushed toilet, access to electricity, charcoal as cooking fuel, the number of cows, the number of bulls, the number of calves, the number of motorbikes, the number of cars, the number of fridges, the number of sofas, the number of (modern) beds, the number of radios, the number of tables, the number of chairs, the number of clocks, the number of televisions, the number of watches, the number of mobile phones, the number of computers, and the number of cabinets.

[8] Principal component analysis was used to compute the two indexes. For household wealth, only those items were included with eigenvalues higher than 10%. For locus of control, however, items were included with eigenvalues higher than 5%. If not, the index would be based on too few items.

significantly larger proportion of girls than boys indicates their mother runs a business as the most important income generating activity.

These differences suggest that for girls to be enrolled in the sixth form, they need to have better socioeconomic characteristics than boys. This may partly explain the gender gap in school enrolment, with almost double the number of boys enrolled in the sixth form than girls, especially in Sironko where girls only make up 28% of the sample. It also points out a between-group difference in the sample, as boys and girls enrolled in the last class of secondary school come from different backgrounds.

The gender gap in school enrolment and compositional differences between boys and girls in our sample correspond with the statistics of the most recent demographic and health survey in Uganda (Uganda Bureau of Statistics, 2018b). Despite an increasing number of girls with an education, the report states that only 6.3% of the women who fall in the age category 15-49 have completed secondary education or higher in the Bugisu region, whereas 11.1% of the men in the age category 15-49 have completed secondary education or higher. The women who have completed secondary education or higher belong primarily to the highest wealth quintile, while the statistics for men with similar education levels show more variation in wealth quintiles. In addition, the current gross school attendance ratios for the Bugisu region (to which the Mbale district and Sironko district belong) reveal that still relatively more boys than girls attend secondary school in the Bugisu region.

2.4.3. Descriptive statistics of paired aspirations

In the following section, we discuss the scores assigned to the aspirations. First, we use a one-sample t-test to test whether participants consider the paired aspirations competing, which triangulates the interview findings. We then examine whether boys and girls aspire to one of the paired aspirations statistically significantly more than its alternative, using a one-sample t-test. We also use kernel density plots to graph gender differences in aspirations. In a final paragraph, we use a two-sample t-test to examine gender differences in aspirations.

A one-sample t-test is used to examine the extent to which participants consider paired aspirations ‘competing’. The 5-point Likert scale includes a ‘neither disagree, nor agree’ option, represented by a response score of 3, and we test whether the mean responses are statistically significantly higher than this indifference point. As can be

seen in Table 4, the responses support the anecdotal findings from the qualitative interviews. The scores for each of the six pairs on whether the aspirations are competing or not are statistically significantly higher than 3. Therefore, we conclude that the six aspirations that we derived from the interviews are relevant alternatives that compete with the aspiration to become economically independent. We also test whether we find any gender differences in the level to which boys and girls consider the aspirations paired competing. The t-test results can be found in Appendix A.5 and show no statistically significant gender differences in five of the six pairs, implying they are equally relevant to boys and girls. When pairing economic independence with childbearing, however, we find that girls assign statistically significantly higher levels of competition between the two aspirations than boys. This is not surprising, as boys are less constraint by pregnancy.

Table 4. One-sample t-test. Perception of competition between aspirations

Paired aspirations	Mean
Economic Independence - Getting Married	3.40***
Economic Independence - Getting Children	3.36***
Economic Independence - Living in Peace with Relatives	3.57***
Economic Independence - Living Near Family / Friends	3.43***
Economic Independence - Active Community Member	3.66***
Economic Independence - Obtaining Higher Education	3.56***
Observations	572

Notes. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. One-sample t-test, with H_0: response = 3.

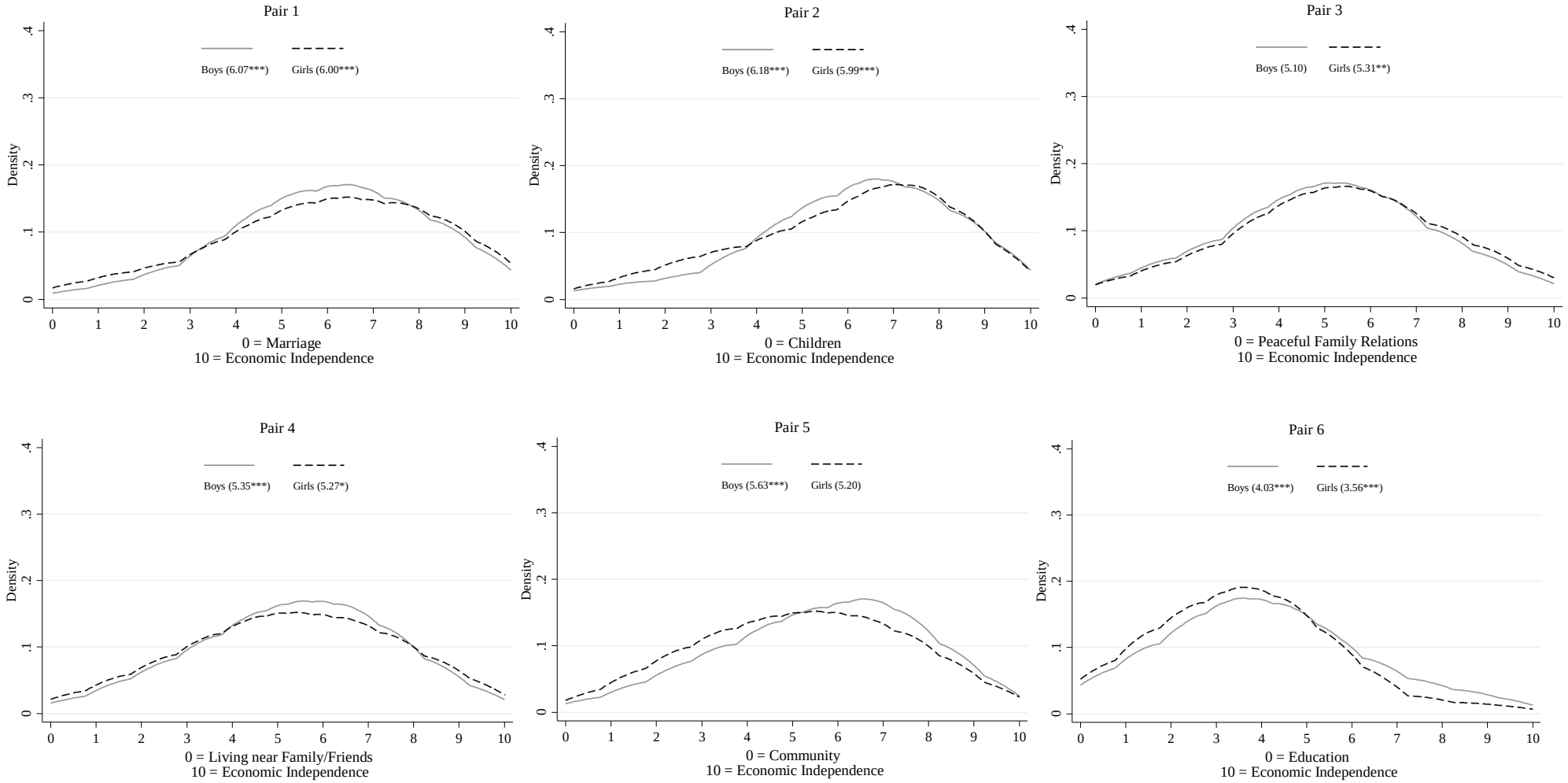
To analyse the boys' and girls' responses to the extent to which economic independence is aspired in relation to competing alternatives, kernel density plots and one-sample t-test results are displayed in Figure 1. The horizontal axes of the plots represent a continuum between 0 and 10 (11-point Likert scale with cardinal properties) reflecting the distributional preference between economic independence and its alternatives. The kernel density plots and the one-sample t-test results provide insight in which aspiration per pair is preferred, together with the strength of the preference. The one-sample t-test compares whether the aspirations paired differ statistically significantly from the indifference score, represented by a Likert score of 5 (i.e. the allocation of 5 coins to each aspiration paired). Per pair, only the score given to economic independence is tested, as it correlates perfectly with the score of its

alternative. At the top of each plot, we report the independent mean scores for boys and girls on economic independence, the aspiration representing the right end of the horizontal axis.

The one-sample t-test results in Figure 1 show that in pair 1 (getting married), pair 2 (childbearing), and pair 4 (proximity of family and friends) the values boys and girls assign to economic independence are statistically significantly higher compared to our indifference point of 5. In pair 6 (higher education), the values boys (4.03) and girls (3.56) assign to economic independence are statistically significantly lower compared to the indifference score of 5. Boys feel indifferent about trading off economic independence with peaceful family relations (5.10) in pair 3. The value that girls assign to economic independence (5.31) in pair 3, however, is statistically significantly higher than the indifference score. Also, girls feel indifferent about trading off economic independence with community engagement (5.20) in pair 5, whereas the value that boys assign to economic independence (5.63) is statistically significantly higher than 5. The kernel density plots, however, do not graph large differences between the aspirations of boys and the aspirations of girls. In sum, the one-sample t-test results demonstrate that both boys and girls aspire statistically significantly more to economic independence than five out of six competing alternatives.

A two-sample t-test of equal means is used to examine gender differences in the responses on the six pairs. The test results in the last column of Table 5 reveal that boys have statistically significantly higher economic aspirations when paired with community engagement and obtaining higher education than girls, evidenced by mean differences of 0.422 and 0.470. As the scores of paired aspirations correlate perfectly, a mirrored perspective implies that girls assign more value to the two competing alternatives than boys.

Figure 1. Kernel density plots of paired aspirations by gender



Notes. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Each plot reports the mean scores for economic independence and the results of a one sample t-test (with H_0: score = 5) by gender.

Table 5. Two-sample t-test. Aspiration levels by gender

Paired aspirations	Mean difference
Economic Independence - Getting Married	0.074
	(0.188)
Economic Independence - Getting Children	0.198
	(0.190)
Economic Independence - Living in Peace with Relatives	-0.207
	(0.189)
Economic Independence - Living Near Family / Friends	0.076
	(0.187)
Economic Independence - Active Community Member	0.422**
	(0.185)
Economic Independence - Obtaining Higher Education	0.470**
	(0.182)
Observations	572

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. Standard error in parentheses. The gender base level is boy. Each row represents an independent two-sample t-test.

2.4.4. Regressions; gender differences

In this section, we use multiple linear regression analysis to check the robustness of the two-sample t-test results. The ordinal properties of the survey responses allow ordinary least squares regression as analysis technique. Although an 11-point Likert scale is a set of ordered categories, we treat the aspiration scores as interval variables. We assume the underlying concept of assigning importance to aspirations as continuous, and intervals between the eleven points equal.[9] We present a regression model with the scores on the paired aspirations as six dependent variables and gender as the explanatory variable. Our model also includes socioeconomic controls and class-level fixed effects:

$$Y_i = \alpha + \beta_1 G_i + \beta_2 V_i + \mu_c + \varepsilon_i \quad (1)$$

[9] Existing studies demonstrate that dependent variables based on Likert scales can still be used for parametric tests, despite their ordinal properties, and often lead to robust inference. See, for example, Bollen and Barb (1981), Bollen, Glanville, and Stecklov (2001), and Norman (2010).

Here, Y_i represents the score assigned to economic independence in one of the six pairs of individual i. Gender effects are represented in G_i, and codes as 1 for girls, and 0 for boys. μ_c are class-level fixed effects. The error term is captured in ε_i. The unobservable characteristics of students belonging to the same class may be correlated, for example, because of exposure to similar teachers, but they are not correlated with students in other classes. Therefore, standard errors are bootstrapped and clustered at the class level to deal with any remaining correlation of the error term within classes.

Vector V captures a set of socioeconomic controls to reduce the risk of omitted variable bias. Socioeconomic characteristics correlate with gender as the results of the two-sample t-tests have demonstrated in Table 3. Omitting socioeconomic variables allows the compositional differences between boys and girls to influence the gender coefficients, and as girls come from a relatively better socioeconomic background than boys, this may result in downward-biased estimates for gender on economic aspiration levels.

We use the same set of controls for each pair of aspirations. The first control is a household wealth index score. In Uganda, girls enrolled in high school generally come from wealthier families (Uganda Bureau of Statistics, 2018b), but in our sample, boys come from wealthier households.[10] The household wealth index is primarily based on the assets of economically productive household members, and as students are unlikely to contribute significantly to the household wealth, we tackle potential endogeneity between economic aspirations and wealth. Moreover, we add a locus of control index to our set as the results from the two-sample t-test in Table 3 reveal statistically significant gender differences, with girls feeling more in control than boys. As we expect locus of control to also have an effect on economic aspirations, not controlling for it could bias the gender coefficients. We also include monthly religious participation, as girls in our sample participate more in religious services than boys although the difference is only marginally significant.[11] Religious participation may

[10] Although a two-sample t-test (Table 3) did not show any gender difference in household wealth levels, regressing the wealth index scores on gender reveals a statistically significant negative coefficient for girls (-0.699, $p < .05$) in our sample. As girls do better on all of the other socioeconomic characteristics, we expect boys to have over-reported their household assets.

[11] When regressing monthly religious participation on gender, the results indicate that girls participate 1.2 times ($p < .1$) more in religious services than boys per month.

increase the importance of social aspirations like marriage and children and omitting it from the regression may lead to downward biased gender coefficients. Moreover, the socioeconomic characteristics of the parents shape the aspirations they have for their children, which in turn affects the aspirations of the students (Schoon, Martin, & Ross, 2007). This often differs for boys and girls. First, the type of work of the parents differs for boys and girls, as shown in Table 3. Therefore, we include income-generating activities of the father and mother and add dummies for whether the parent farms, runs a business, has salaried employment, has other employment, or has died. Adding a category per parent to capture whether the parent has deceased or not allows us to also include students who have lost one or both parents. Without that category we could only include students of which both parents are still alive, which is not representative for the student population (25% of the respondents indicate they lost their father, and 10% indicate they lost their mother). Second, we add dummies for whether the father and mother have followed higher education (secondary school or higher) as highly educated parents not only transmit the importance of education to boys but invest in the education of girls more than low educated parents. Last, birth order is included, as girls have a statistically significantly higher birth order than boys.

Several socioeconomic characteristics are not included as controls. First, despite statistically significant gender differences, age is excluded due to reliability issues (i.e. students not knowing their age or date of birth). Second, girls perform better at school than boys. However, including school results as control variable could lead to endogeneity issues (i.e. do aspirations shape school results or do school results shape aspirations?). We also exclude household size as no gender differences are found. Tribe is also excluded from our model. Not only do we not find any gender differences, but we also expect any potential aspirational differences to be caused by differing levels of traditionalism and customary beliefs, rather than differences between tribes.

The regression results are presented in Table 6.[12] We use two models to check the robustness of potential gender effects; a first simple linear model with class-level

[12] As our sample is stratified based on location, we have also analysed rural/urban differences and gender differences in the two location subsamples. Without class-level fixed effects, a gender dummy and the set of control variables, we find location effects in pair 3 (peaceful relations) and pair 6 (education). Mbale students aspire statistically significantly more to economic independence than Sironko students. These results are robust when adding a gender dummy and socioeconomic controls.

fixed effects but no socioeconomic controls, and a second multiple linear model with class-level fixed effects that adjusts for socioeconomic variables, which uses the fully specified model in equation (1). Each row in Table 6 represents a regression where the number of tokens assigned to economic independence in each of the pairs is regressed on gender. The full regression results that include the estimates for the socioeconomic controls can be found in Appendix A.6.

Table 6. Gender differences in weights given in paired aspirations

Paired aspirations	(1)	(2)
Economic Independence - Getting Married	-0.115	-0.281**
	(0.158)	(0.118)
Economic Independence - Getting (more) Children	-0.229	-0.382**
	(0.182)	(0.171)
Economic Independence - Living in Peace with Relatives	0.070	0.002
	(0.188)	(0.192)
Economic Independence - Living Near Family / Friends	-0.200	-0.313**
	(0.171)	(0.154)
Economic Independence - Active Community Member	-0.513***	-0.651***
	(0.146)	(0.175)
Economic Independence - Obtaining Higher Education	-0.620***	-0.644***
	(0.155)	(0.157)
Observations	572	572
Controls	No	Yes

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. OLS regressions with class-level fixed effects. Bootstrapped standard errors clustered at the class level and in parentheses. The gender base level is boy, and the coefficient represents the effect of girl=1. Each row represents a separate regression where a different pair of aspirations (i.e. the number of tokens assigned to economic independence) is regressed on gender, while each column represents a different model (i.e. with and without control variables).

As can be seen in the first column of Table 6, the results of the simple linear model are corresponding with the findings of the two-sample t-test in Table 5. Including gender

However, apart from pair 5, we do not find differing gender effects in the two location subsamples when using a Chow test. Many students from rural areas attend school in Mbale, which could explain the lack of location effects. These regression results are also in line with the open-ended interviews that did not reveal substantial differences between Sironko and Mbale. For the sake of statistical power, we use the full sample in the remainder of the paper.

as a single explanatory variable reveals effects in the 5th and 6th pair at the 1% level. However, this model does not reduce the risk of omitted variable bias. Therefore, we add socioeconomic controls and find statistically significant gender effects on aspiration levels in five of the six pairs, as the last column in Table 6 shows. The gender effect no longer captures the partial effect of the omitted socioeconomic variables. For gender, all statistically significant estimates are negative. With boys being the reference category, this means that girls attach, on average, statistically significantly more value to the competing alternatives of economic independence than boys.

All estimates need to be interpreted on a measurement scale of 0 to 10 (i.e. participants allocated ten tokens over two aspirations). To help interpret any gender differences we add graphs in Appendix A.7 illustrating the predicted weights (i.e. marginal effects) that boys and girls assign to economic independence in each pair of aspirations. Per pair, the difference in predicted weights of boys and girls is the corresponding coefficient presented in Table 6. In the first pair, the coefficient of -0.281 indicates that girls aspire to marriage more than boys, which represents a 5% gender difference in the predicted weights. The coefficient of 0.382 in the second pair shows that girls aspire to bear children more than boys, and the predicted margins reveal a 6% difference in the weights assigned. No gender effect is found in the third pair, which means that boys and girls trade off economic independence with living in peace with relatives similarly. In the fourth pair, girls aspire to live near family and friends more than boys, and the predicted margins reveal a 6% gender difference. The most substantial gender effects are found in the last two pairs. Girls aspire more to be an active community member than boys, and the gender difference in the weights given to the two paired aspirations is 11%. Last, the negative coefficient in the sixth pair illustrates that girls aspire to obtain higher education more than boys, and the coefficient of 0.644 reveals a 16% gender difference. Altogether, the differences between boys and girls are considerable in size, confirming our hypothesis that boys and girls value different aspirations that fit their gender prescribed roles.

2.4.5. Regressions; individual fixed effects

So far, we have examined the paired aspirations independently, assessing the importance of competing aspirations only in direct relation to economic independence.

We are also interested in testing the importance of each competing aspiration relative to the importance of other alternatives, and whether the order of importance of alternatives differs for boys and girls. This test reveals whether some aspirations are more aspired to, and thus more competing to economic independence than others and whether that effect is moderated by gender. To investigate the relative importance, we reshape the data in a long format so that each student has six observations that represent the scores assigned to the alternative aspirations (i.e. panel data). This allows using an individual fixed effects regression. The first model includes the six competing alternatives as single regressor:

$$Y_{ip} = \alpha + \beta_1 A_{ip} + \mu_i + \varepsilon_{ip} \qquad (2)$$

with Y_{ip} being the score assigned by individual *i* to the alternative aspiration in pair *p*. For each of the six alternatives, a dummy variable is included in vector A. The error term is captured in ε_i. We add individual-level fixed effects in μ_i to capture any individual-specific confounding factors and cluster standard errors at the level of the individual. Table 7 illustrates the results of six models, using a different competing alternative to economic independence as the reference category in each model. So, in principle, each model in Table 7 presents the same regression model, but for interpretation reasons we use a different alternative aspiration as base category, resulting in six regressions. This allows us to observe how each alternative aspiration relates to the other five alternatives. Consequently, the regression coefficients are mirrored on both sides of the diagonal axis of Table 7.

The results reveal that the values assigned to the six competing aspirations differ significantly from one another. Starting with obtaining higher education, Model (6) in the last column shows that higher education is statistically significantly more aspired to than any of the other five competing alternatives to economic independence at the 1% level, and obtaining higher education is, therefore, the most important competing alternative to obtaining economic independence. Obtaining higher education as most important aspiration is then followed by living in peace with relatives, which is statistically significantly less important than education, but more important than community engagement, children, and marriage, as can be observed in Model (3). No significant difference is found between living in peace with relatives and living near family and friends. The third most aspired to alternatives are

community engagement and living near family and friends which are considered less important than education and living in peace with relatives, but are given significantly more weight than marriage and children as shown in Models (5) and (4). Fertility and marriage are considered the least competing alternatives to economic independence, as shown in Model (1) and Model (2) in Table 7.

Table 7. The relative importance of competing alternatives

	(1)	(2)	(3)	(4)	(5)	(6)
Getting Married	Ref	0.068	-0.862***	-0.722***	-0.575***	-2.184***
	(.)	(0.098)	(0.105)	(0.107)	(0.112)	(0.115)
Getting Children	-0.068	Ref	-0.930***	-0.790***	-0.643***	-2.252***
	(0.098)	(.)	(0.100)	(0.102)	(0.108)	(0.111)
Peace with Relatives	0.862***	0.930***	Ref	0.140	0.287***	-1.322***
	(0.105)	(0.100)	(.)	(0.090)	(0.102)	(0.104)
Living near Family	0.722***	0.790***	-0.140	Ref	0.147	-1.462***
	(0.107)	(0.102)	(0.090)	(.)	(0.093)	(0.105)
Community	0.575***	0.643***	-0.287***	-0.147	Ref	-1.608***
	(0.112)	(0.108)	(0.102)	(0.093)	(.)	(0.107)
Higher Education	2.184***	2.252***	1.322***	1.462***	1.608***	Ref
	(0.115)	(0.111)	(0.104)	(0.105)	(0.107)	(.)
Constant	3.958***	3.890***	4.820***	4.680***	4.533***	6.142***
	(0.072)	(0.067)	(0.062)	(0.061)	(0.068)	(0.073)
Adjusted R^2	0.176	0.176	0.176	0.176	0.176	0.176
N	3432	3432	3432	3432	3432	3432

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. Individual fixed effects regression. Standard errors clustered at the individual level and in parentheses. Each model represents the same regression model but takes a different aspiration as reference category.

To examine whether the order of importance of alternatives differs for boys and girls, we add an interaction with gender to the regressions in the following way:

$$Y_{ip} = \alpha + \beta_1 A_{ip} + \beta_2 A_{ip}.G_i + \mu_i + \varepsilon_{ip} \quad (3)$$

The interaction term $A_{ip}.G_i$ estimates a gender difference in the relative importance of alternative *p*. As individual fixed effects are captured in μ_i, we do not add a separate term for gender in model (3). The regression results are presented in Table 8.

Table 8. The relative importance of competing alternatives by gender

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A.						
Getting Married	Ref	0.114	-0.967***	-0.721***	-0.446***	-2.036***
	(.)	(0.121)	(0.129)	(0.130)	(0.138)	(0.140)
Getting Children	-0.114	Ref	-1.081***	-0.836***	-0.560***	-2.150***
	(0.121)	(.)	(0.123)	(0.127)	(0.136)	(0.140)
Peace with Relatives	0.967***	1.081***	Ref	0.245**	0.521***	-1.070***
	(0.129)	(0.123)	(.)	(0.106)	(0.122)	(0.130)
Living near Family	0.721***	0.836***	-0.245**	Ref	0.276**	-1.315***
	(0.130)	(0.127)	(0.106)	(.)	(0.112)	(0.130)
Community	0.446***	0.560***	-0.521***	-0.276**	Ref	-1.591***
	(0.138)	(0.136)	(0.122)	(0.112)	(.)	(0.137)
Higher Education	2.036***	2.150***	1.070***	1.315***	1.591***	Ref
	(0.140)	(0.140)	(0.130)	(0.130)	(0.137)	(.)
Panel B.						
Getting Married * Girl	Ref	-0.124	0.281	-0.002	-0.348	-0.396
	(.)	(0.205)	(0.219)	(0.227)	(0.236)	(0.244)
Getting Children * Girl	0.124	Ref	0.405*	0.122	-0.224	-0.272
	(0.205)	(.)	(0.208)	(0.212)	(0.223)	(0.229)
Peace with Relatives * Girl	-0.281	-0.405*	Ref	-0.283	-0.629***	-0.677***
	(0.219)	(0.208)	(.)	(0.193)	(0.217)	(0.214)
Living near Family * Girl	0.002	-0.122	0.283	Ref	-0.346*	-0.394*
	(0.227)	(0.212)	(0.193)	(.)	(0.197)	(0.219)
Community * Girl	0.348	0.224	0.629***	0.346*	Ref	-0.048
	(0.236)	(0.223)	(0.217)	(0.197)	(.)	(0.218)
Higher Education * Girl	0.396	0.272	0.677***	0.394*	0.048	Ref
	(0.244)	(0.229)	(0.214)	(0.219)	(0.218)	(.)
Constant	3.958***	3.890***	4.820***	4.680***	4.533***	6.142***
	(0.072)	(0.067)	(0.062)	(0.061)	(0.068)	(0.073)
Adjusted R^2	0.179	0.179	0.179	0.179	0.179	0.179
N	3432	3432	3432	3432	3432	3432

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. Individual fixed effects regression. Standard errors clustered at the individual level and in parentheses. Each model represents the same regression model but takes a different aspiration as reference category.

Again, we use each alternative aspiration as base category in the regression, resulting in six regressions presented in the columns of Table 8. Panel A of the table shows the relative importance of the competing aspirations for boys relative to becoming

economically independent. Starting with the most aspired to alternative, we observe in Model (6) that boys aspire the most to obtaining higher education, which is considered statistically significantly more important than any of the other alternatives. As second-most important aspiration, boys aspire to living in peace with relatives as shown in Model (3). In contrast to the pooled sample, we observe a significant difference between living in peace with relatives and living in the proximity of family and friends. Model (4) illustrates that living near family and friends is the third most important aspiration. Community engagement is aspired to less than obtaining higher education, living in peace with relatives, and living near family and friends, but is aspired to more than marriage and childbearing. Similar to the pooled sample, these two aspirations are aspired to the least, as all coefficients in in Model (1) and Model (2) are negative. Boys are indifferent, however, in the extent to which they aspire to children and marriage.

We now move to panel B of Table 8, which reveals how girls differ from boys in valuing the competing aspirations relative to becoming economically independent. The significant coefficients in Model (6) suggest that girls aspire to obtaining higher education statistically significantly more than boys when compared to living in peace with relatives and living near family and friends. The results for community engagement in Model (5) reveal similar findings. Girls aspire to becoming an active community member statistically significantly more than boys when compared to living in peace with relatives and living near family and friends. Moreover, girls aspire to childbearing more than boys when compared to living in peace with relatives, but Model (2) shows this difference is only marginally significant. We do not observe a gender difference in the extent to which boys and girls aspire to getting married in Model (1).

In sum, the individual fixed-effects regression results presented in Table 7 and Table 8 add to the previous OLS regression findings of Table 6 and demonstrate that boys and girls value the competing alternatives to economic independence differently. They illustrate that obtaining higher education is undoubtedly the most important competing alternative to economic independence for both gender groups but for girls statistically significantly more than for boys in Models (3) and (4). Girls also aspire to becoming an active community member and bearing children more than boys when compared to living in peace with relatives and living near family and friends. Alternatively, the regression results signify that after obtaining higher education,

maintaining peaceful relations with relatives and living near relatives and friends are important competing aspirations to economic independence for boys, to which they aspire more to than girls when compared with community engagement and childbearing.

2.5. Discussion of the results

This section brings together our results and positions the findings in relation to existing studies. We first discuss the relevance and importance of the pairs of aspirations to both gender groups and then elaborate on gender differences in economic aspirations. Last, we discuss the implications of our findings for policy and interventions that aim to increase girls' economic empowerment.

In the interviews, boys and girls reveal that their economic aspirations revolve around independence and autonomy and compete with six alternative aspirations. On the base of this, we paired economic independence with the six alternatives in our survey. The one-sided t-test results reveal that boys and girls consider all six pairs of aspirations competing. In the levels of competition between aspirations, we find one gender difference, which indicates that girls deem childbearing more competing to economic independence than boys. This finding corresponds with a large body of literature (Agüero & Marks, 2011; Aldaz-Carroll & Morán, 2001; Cáceres-Delpiano, 2012; Canning & Schultz, 2012; Cao, 2019; Wong & Levine, 1992) that shows that childbearing has a direct adverse effect on the economic opportunities of women in developing countries, especially regarding labour force participation and the type of work pursued.

The one-sample t-test results in Table 4 provide evidence that boys and girls aspire to economic independence statistically significantly more than to most of its alternatives, apart from obtaining higher education. That girls, like boys, strongly aspire to economic independence relates to Narayan, Patel, Schafft, Rademacher, and Koch-Schulte (2000), who claim that gender identities are shifting, and an increasing number of women contribute financially to the household now. Also, Langevang and Gough (2012) show that the social status of working young women has improved, while Kabeer (1997) states that women consider greater independence as highly desirable, accomplished through an own income. However, when we regress the aspiration scores on gender and control for socioeconomic variables, we find five

gender effects. These gender differences reveal a significant gap in the economic aspirations of boys and girls, where girls aspire statistically significantly more to the competing alternatives that affect their economic empowerment. In the next sections, we discuss the five gender effects in relation to studies on similar issues and elaborate on their implications.

The regression result of the first pair of aspirations (economic independence vs marriage) indicates that girls aspire to marry more than boys as an alternative to economic independence. To relate our findings to marital behaviour in Uganda, we look at the 2016 Uganda Demographic and Health Survey (Uganda Bureau of Statistics, 2018b), which shows that 1.9% of boys aged between 15 and 19 are in union (i.e. marriage or cohabitation), whereas for girls in the same age range this percentage is ten times higher at 19.9%. The age category 20 to 24 also demonstrates large gender discrepancies in being in union, with 33.8% of boys and 64.0% of girls living in union. Naturally, dominant social norms prescribe that girls should marry at an early age, which means that girls are often forced to marry younger than boys. In addition, girls are also more frequently victims of early child marriages, and are forced to marry to avoid the shame of pregnancy outside the marriage, all causing a gender discrepancy in union. Our findings demonstrate that girls also aspire stronger to getting married than boys as an alternative to economic independence, which could also be the result of these dominant social norms. Girls then aspire to certain life goals that society considers the most appropriate for them. This means that these norms not only have a direct effect by forcing young girls into marriage, but they also indirectly shape the aspirations of girls, ultimately contributing to marrying at a younger age than boys. This gender difference in marital aspiration is thus anchored in existing gender systems, as Mason (2001) states, where society pressures girls to marry at an earlier age than boys. However, in addition to this pressure there may also be an economic explanation which is relevant for girls but not boys. Girls who want to get married early may also act out of economic rationality. Zwang (2004), for example, demonstrates that South African girls' marital aspirations are driven by the desire to obtain financial support from spouses.

The regression results also demonstrate that girls aspire to childbearing more than boys as competing alternative to economic independence (second pair of aspirations). This concurs with findings that illustrate that gender norms shape childbearing aspirations of girls (Adams et al., 2013) and young women's status

largely depends on their fertility, defining entry into adulthood (Gupta, 1995). However, fertility desires of girls in sub-Saharan Africa are also motivated by the idea of having an extended family and relying on economic support from children in later life (Caldwell & Caldwell, 1987). Moreover, infertile and childless women are stigmatised, especially in sub-Saharan Africa, and often experience domestic violence, economic deprivation, and psychological distress (Larsen, Hollos, Obono, & Whitehouse, 2010; McCloskey, Williams, & Larsen, 2005). Childless men share these consequences less (Fledderjohann, 2012). Even though Ugandan fertility preference statistics illustrate that boys want more children (5.4) than girls (4.8) (Uganda Bureau of Statistics, 2018b), our result may signpost that girls aspire stronger to the actual 'accomplishment' of bearing a child, showing their fertility potential at young age, securing social status and avoiding stigmatization.

When pairing the aspiration to living near family and friends with economic independence (third pair of aspirations), we find a third gender difference, with girls aspiring to the former more than boys. An explanation of this effect could lie in the differing levels of freedom boys and girls experience from family. Aspirations of independence are formed in interaction with family members, and the explicit and implicit expectations they place on youngsters, and the gender norms that come with them (Whitehead, Hashim, & Iversen, 2007). As a consequence, women are more under patriarchal control of kinship and community than boys. Boys are then more likely than girls to leave family behind to migrate and find employment, pursue economic opportunities, and build new human capital which is believed to accelerate economic independence (Langevang & Gough, 2009).

We also find a gender difference in the fifth pair (economic independence vs community engagement). The regression results reveal that girls aspire to actively engage with their community more than boys as an alternative to economic independence. This result is linked to studies that have shown that women in sub-Saharan Africa struggle to build social capital, especially nonfamilial, which affects their ability to obtain and exchange information and their economic output (Fafchamps & Minten, 2002; Katungi, Edmeades, & Smale, 2008). Frequently mentioned causes relate to gender norms and the abundance of responsibilities around the household. Therefore, communal activities provide the scarce opportunity to build social capital for women outside the household. Such community engagement can take various forms, from informal interactions with neighbours to more fixed, gender-based forms

like church groups, savings and micro-finance groups, who can stimulate girls in collective action and improve their autonomy and decision making power (Alemu et al., 2018; De Hoop, van Kempen, Linssen, & van Eerdewijk, 2014). In that way, community engagement is a more subtle, nuanced mechanism for girls to obtain influence and autonomy, which can motivate women to invest in social networks with other women in particular (Narayan et al., 2000).

Last, we find that both gender groups aspire to obtaining higher education more than to obtaining economic independence (sixth pair of aspirations). This is not surprising, as our participants are high school students and belong to a relatively highly educated elite. Students are, therefore, very much aware of the merit of their education and the employment opportunities it offers them, especially when compared to the opportunities of peers who have dropped out of school. However, also here we find a gender difference in the aspiration to obtain higher education. Girls find education more important than boys. A plausible explanation for this difference in our research context could be that educated girls not only belong to a relatively more elite group than educated boys, but education also qualifies them for a type of employment that is more beneficial to them, like office jobs that require less manual labour (Duflo, 2012).

Altogether, the gender differences reveal an aspiration gap between boys and girls that needs to be closed. To feel economically empowered, young girls need to break a poverty trap where girls aspire to their gender prescribed roles. Our result concurs with studies that demonstrate that gender norms define women's roles, which lower aspirations and limit what young girls consider possible employment in society (Field, Jayachandran, & Pande, 2010). These gender norms are difficult to change, as Beath, Christia, and Enikolopov (2012) show in their study on Afghanistan. To break that cycle, development policies should not only aim to raise the economic aspirations of girls but also aim to address the social empowerment issues that maintain gender inequalities. As aspirations are shaped in early life, interventions that target adolescent girls are then more effective than interventions that target women at later stages in life (Heckman & Mosso, 2014).

Vocational training and entrepreneurship promotion among young women, in combination with social empowerment, has most potential to accelerate women's empowerment. There are a number of policy interventions that have taken an intensive, multi-faceted approach and have proven successful. One of the main programmes is The Adolescent Girls Initiative (AGI), launched in 2008 by The World Bank to get an

understanding of how best to facilitate girls' transition from school to productive employment. The interventions that are part of this programme are aimed at addressing the challenges girls face in their economic endeavours from competing pressures like childbearing and early marriage, and negative gender norms regarding women's employment. Some impact evaluations have demonstrated the success of this programme in sub-Saharan Africa. Adoho, Chakravarty, Korkoyah, Lundberg, and Tasneem (2014) provide evidence that the Liberia programme largely increased the employment and earnings of treated girls, relative to non-treated girls. It also increased their confidence in personal relationships with spouses and partners, relaxing existing gender norms. Botea, Chakravarty, and Haddock (2015) evaluated the Rwanda programme and show a strong increase in girls' employment, especially in businesses, wage employment and internships, and a substantial increase in the earnings and savings of girls. As a consequence of this, entrepreneurial confidence grew, and social networks of girls expanded. Also outside this programme, similar initiatives have been implemented, as shown by Bandiera et al. (2017) who evaluate a programme that focused on school going girls and girls that had dropped out of school. Their evaluation reveals that a combination of technical skills and life skills increased employment, mainly driven by self-employment activities. The programme also reduced teen pregnancies, early marriage and cohabitation, and, more importantly perhaps, it impacted the long-term aspirations of girls, with girls shifting the ideal age for marriage and childbearing upwards.

When interpreting our main findings, we should bear in mind that the female students have a relatively better socioeconomic position than the male students. Their socioeconomic background is presumed to come with a more liberal outlook on life that is less bound to gender norms and provides better access to employment opportunities that make higher economic aspirations more realistic and attainable. When comparing these female students with male students from socioeconomically less prosperous families, we still find significant gender differences in their economic aspirations. Our results are thus very likely underestimations and conducting a similar analysis with a more representative sample from our research area would probably lead to more substantial aspiration differences between boys and girls. That said, the girls in our sample will still very likely experience substantial competing pressures from other alternatives that will limit their future economic opportunities in the

transition from school to employment, which the boys in our sample will suffer to a much lesser degree.

2.6. Conclusion

Our study examines gender differences in the aspirations of adolescents in Uganda in the economic, social and educational domains, which compete with each other for time, effort and resources. Using semi-structured interviews to identify the relevant aspirations of boys and girls in the greater Mbale area in Uganda we found that their economic aspirations revolve around independence and autonomy. The results of these interviews also showed that economic aspirations compete with six alternative aspirations in the social and educational sphere. In random order of importance, these alternatives are childbearing, marriage, living near family and friends, living in peace with relatives, engaging with the community, and obtaining higher education. In a second step, we paired the aspiration to become economically independent with the six competing alternatives in a survey to elicit the individual aspirations of high school students. The one-sample t-test results show that apart from obtaining higher education, boys and girls aspire to obtaining economic independence statistically significantly more than to each of the alternatives. Boys aspire to economic independence the most when paired with getting children, while girls aspire to economic independence the most when paired with getting married. Although boys are undecided between economic independence and living in peace with relatives and girls between economic independence and community engagement, our results stress the importance of economic aspirations to boys and girls.

As the male and female students have different socioeconomic backgrounds, with girls coming from socioeconomically 'better' households than boys, we control for socioeconomic variables in our OLS regression model. We observe that girls aspire to five of the six alternative aspirations statistically significantly more than boys do. In order of largest to smallest absolute gender difference, the results reveal that girls aspire more to engaging actively in the community, obtaining higher education, getting children, living in the proximity of family and friends, and getting married than boys do. We do not observe a gender difference in the trade-off between living in peace with relatives and economic independence.

We also studied the relative importance of each alternative to economic independence and examined whether their order of importance differed for boys and girls. The results from the individual fixed effects regressions show that obtaining education, living in peace with relatives and living in the proximity of family and friends are the most important alternatives to economic aspirations. From the six alternatives we list in this study these aspirations have the most constraining influence on the aspiration to obtaining economic independence. Getting married and getting children are the least important alternatives to the economic aspirations of youngsters. However, in the order of importance we also found gender differences. For boys, maintaining peaceful relations with relatives is significantly more constraining to their economic independence than for girls, whereas for girls obtaining higher education and engaging with the community are significantly more constraining to their economic independence than they are for boys.

In sum, our results reveal important gender differences in the economic aspirations of youngsters with girls aspiring to alternative aspirations more than boys. Policies that are aimed at increasing the economic empowerment of girls should, therefore, not only focus on vocational training and entrepreneurship promotion. Our result demonstrate that interventions can only be successful if they also include an empowerment component that alleviates the internal constraints of girls' economic aspirations which result from negative gender norms regarding women's employment and strong social pressure to obey dominant gender roles.

Chapter 3. Peer effects in aspirations through social networks in Uganda

Abstract

This paper investigates the extent to which the aspirations of adolescents are influenced by the aspirations of their friends. For this, we elicit data on the aspirations of more than 500 high school students in Uganda. Aspirations are made context-specific and operationalised, identifying trade-offs between economic aspirations and three competing aspirations in the social sphere. Considering classmate friends as important friends, we elicit the friendship ties students have with their classmates. To identify peer effects in aspirations, we instrument the aspirations of friends with the characteristics of non-overlapping friends. In two of the three pairs of aspirations, we find positive peer effects. High school students influence each other in the weight given to aspirations to live in the proximity of family and friends, and aspirations to engage with the wider community, relative to economic aspirations. Our results imply the existence of important peer effects among high-school students, which can be useful for development programmes aimed at lifting the aspirations of young people.

Keywords: aspirations, peers, social networks, non-overlapping peers, instrumental variable estimation, GMM.

3.1. Introduction

There is a strong link between poverty and aspirations. The ability of people to invest effectively in their future, which is essential to escape poverty, draws heavily on their 'capacity to aspire' (Appadurai, 2004). To identify pathways out of poverty, it is therefore important to understand how aspirations are formed. We assume that most aspirations take shape during adolescence, as it is during this period in life that one starts to develop an idea of what one could and would like to achieve in their life. Moreover, aspirations are "formed in interaction and the thick of social life" (Appadurai, 2004, p. 67). An important channel through which adolescents' aspirations are formed is through peer influences among classmates. The aspirations of classmates function as important reference points, which help shape what is considered important and achievable in the future.

To improve our understanding of the role of peer effects among adolescents in the formation of aspirations, we identify trade-offs between economic independence and three aspirations in the social sphere. We assume that aspirations are competing, and youngsters experience competition from social alternatives when trying to obtain their economic independence. These social alternatives are often the result of social norms and obligations that hinder the economic empowerment of young people. Various development programmes endorse this rationale and have demonstrated that in order to improve economic empowerment, social empowerment issues need to be addressed as well (see, for example, Bandiera et al. (2017) on a programme that targets Ugandan girls). Peer influences could help shape economic aspirations while lowering the perceived importance of social alternatives.

We elicit the weight given to the aspirations in each pair of a sample of 538 high school students in Uganda. We also collect data on the friendship ties students have with their classmates. To identify the extent to which aspirations are influenced by the aspirations of friends in the classroom, we instrument friends' aspirations with the socioeconomic characteristics of non-overlapping friends. We also control for class-level fixed effects and a number of individual and contextual characteristics. We find evidence in support of positive peer effects in two of the three pairs of aspirations.

Several studies are related to ours. First, some studies paid attention to peer influence on aspirations in a developing country context. Beaman et al. (2012) demonstrate that female leadership inspires adolescent girls' career aspirations in India. Bernard et al. (2014) provide evidence from Ethiopia that watching a documentary about successful people from similar communities significantly increases the aspirations of individuals, which stimulates their educational spending and time they spent on work. Macours and Vakis (2014) use geographical proximity and communication patterns to analyse the role of social interactions in shaping aspirations in Nicaragua. They provide empirical evidence that local leaders affect households' capacity to aspire, which stimulates productive investment behaviour.

Second, outside development economics, a growing number of studies have focused on peer effects within social networks. Bramoullé et al. (2009) validate the use of friendship networks of secondary school students to identify peer effects in the consumption of recreational services. De Giorgi et al. (2007) use a similar identification strategy and present evidence that an individual is more likely to choose a college major when peers make the same choice. Also, Cingano and Rosolia (2012)

and Arcidiacono et al. (2012) use individual specific networks to investigate peer effects in employment rate and school performance respectively. Goldsmith-Pinkham and Imbens (2013) add to this and develop models that allow endogeneity of peer group formation.

In sum, while several studies have looked at peer influence in the formation of aspirations in a developing country context, none of them has taken account of the social networks through which such peer effects take place. Our study bridges both literatures, by following the approach developed by a growing number of economists that look at social effects within social networks. We also contribute to the latter literature, as peer effects in networks on aspirations have not been studied yet. While most studies focus on peer effects in behaviour, we examine peer effects in stated preferences. Our study highlights the potential of social interactions in changing aspirations.

First, we present an economic model in section 2 which explains the mechanism behind social effects. This is followed by our identification strategy in section 3. Section 4 describes the results and section 5 concludes and discusses the implications for development policy.

3.2. Social effects: conforming to the norm of friends

In the next section, we present an economic model to explain why individuals adapt their aspirations to their peers, and to increase our understanding of the underlying mechanisms of peer effects. Various studies provide theoretical frameworks that explain this behaviour. Kandel and Lazear (1992), for example, provide a framework that demonstrates that peer pressure incentivises workers and that they get penalised when working less (e.g. free-riding) than the norm. Moreover, not conforming to social norms increases the distance between the individual and the group average, resulting in a loss of reputation and social status. Also, the model Bernheim (1994) proposes highlights the importance of status. Individuals have heterogeneous preferences but act homogeneously, as deviating status will impair social status. In addition, Akerlof (1997) presents a model of social distance, implying that individuals with similar social status and hierarchy interact, while interaction with those further away is limited. Acting differently from like-minded peers may then lead to negatives like envy or jealousy, providing incentives to keep distances between peers low.

We take these frameworks as a starting point and adjust a social network model that considers the average aspirations of friends as the social norm in an individual's social neighbourhood. The individual incurs a cost when deviating from this norm. Therefore, each individual wishes to conform to the average aspirations (i.e. social norm) of their friends as much as possible to maximise his or her utility. In the literature, this model is also known as the local average model and is used in Boucher, Bramoullé, Djebbari, and Fortin (2014), Liu, Patacchini, and Zenou (2014), and Patacchini and Zenou (2012), amongst others. In this model, conformism positively influences the utility of the individual. Patacchini and Zenou (2012, p. 2) define conformism as "the idea that the easiest and hence best life is attained by doing one's very best to blend in with one's surroundings and to do nothing eccentric or out of the ordinary in any way". In sum, conformism revolves around the action to integrate into the social environment and to obey dominant norms that prescribe preferences and corresponding behaviour.

Each individual derives utility from having certain initial aspiration levels. But each individual has an individual-specific set of close friends in his or her class. We assume that an individual's utility decreases with the distance from the average aspiration levels of his or her close friends. The individual maximises his or her utility by keeping the distance between the individual aspiration levels and the average aspiration levels of their own individual-specific reference group as small as possible.

To formalise this, we use the economic framework suggested by Patacchini and Zenou (2012) and Liu et al. (2014) and apply it to students and their classmates. The direct social connections (i.e. close friends) between students are registered in the adjacency matrix $\mathbf{G} = [g_{ij}]$, where $g_{ij} = 1$ if student i reports student j as close friend, and $g_{ij} = 0$ otherwise. The set of i's friends is i's reference group and is denoted as $N_i = \{j \neq i | g_{ij} = 1\}$. The size of N_i is then $g_i = \sum_{j=1}^{n} g_{ij}$, and assuming that there are no isolates in the classroom (i.e. every student reports at least one close friend) $g_i > 0$. As we look at the *average* aspiration level of friends, the adjacency matrix $\mathbf{G}$ is row-normalised, as denoted by $G^* = [g_{ij}^*]$, with $g_{ij}^* = g_{ij} / g_i$. It means that we always have $0 \leq g_{ij}^* \leq 1$ and $\sum_{j=1}^{n} g_{ij}^* = 1$.

The aspiration level of individual i is denoted as y_i, and the average aspiration level of the population in i's individual-specific network r is denoted as $Y_r = (y_{1r}, \ldots, y_{n_r r})$. The average aspiration level in i's network r is established by all

students in the network at the same time to maximise their individual utility. Based on Becker (1996) and Liu et al. (2014) we suggest the following utility function

$$\mathrm{u}_{ir}(\mathrm{y}_{ir}) = \mathrm{u}_{ir}(\mathrm{y}_{ir};\ \mathrm{Y}_r, \mathrm{G}_r) = \pi^*_{ir} y_{ir} - \lambda\left(y_{ir} - \sum\nolimits_{j=1}^{n_r} \mathrm{g}^*_{ijr} y_{jr}\right) \qquad (1)$$

which has a structure with two components that represent the benefits and costs of, in our case, aspiration levels. The first component is denoted as a linear function of a student's own aspiration level y_{ir}, and the term $\pi^*_{ir} y_{ir}$ represents the return to the individual aspiration level. The ex-ante heterogeneity in the return to the aspiration level is denoted as π^*_{ir} and captures the differing initial aspiration levels of students (i.e. before social comparison). This means that not every student has the same aspiration base level before exposure to others, and students may have a different ability to aspire to a certain level and dimension. The term $\pi^*_{ir} y_{ir}$ implies that a different location of student i in the network r does not influence the benefits of an aspiration level.

The cost component of the utility function is denoted as $\left(y_{ir} - \sum_{j=1}^{n_r} \mathrm{g}^*_{ijr} y_{jr}\right)$ and reflects the cost of deviating from the social norm of the network, represented by the average aspiration level of the friends of student i. The parameter λ is the social conformity coefficient, which reflects the desire for conformity. In the utility function (1), $1 \geq \lambda \geq 0$, where 1 implies that a change in an individual's aspiration level correlates fully with a change in the average aspiration level of the local network (full social conformity), or 0 if the individual is not affected at all (no social conformity). As each student reports a different set of friends, they have individual-specific networks, which implies that the entire social conformity term is heterogeneous.

A student's utility decreases with the deviation from the average aspiration level of his or her individual-specific network of close friends. The closer student i's aspiration level is to the average aspiration level of friends, the higher the utility of student i. On the base of this, we expect the aspiration levels of student i to positively correlate with the average aspiration levels of student i's friends.

3.3. Research methods

To elicit the aspirations of students we use a questionnaire with interdependent choices, requiring respondents to value their aspirations in relation to competing alternatives. A Likert scale is used to indicate the strength of preference. The questionnaire also has a section to elicit friendship ties. Students are provided with a list of the names of all classmates, and for each individual in their class, they are asked to indicate whether they are close friends.

3.3.1. Eliciting aspirations and friendship ties

To elicit the aspirations of students and their friendship ties we conducted two phases of fieldwork. First, at the end of 2015, we conducted 38 open-ended interviews with young men and women in the urban Mbale district and the rural Sironko district in the east of Uganda to provide input for the development of the instrument. The interviews formed the base for the development of the pairs of aspirations. For these interviews, we sampled respondents from rural and urban areas, purposively selected to represent a diverse set of young people, ranging from young teenagers to older adolescents. the age limits in Sironko were set at 18 to 21, while in Mbale the age limits were less strict and set at 18 to 23. The reason for using different upper age limits is that we expect young people living in rural communities to face life-determining decisions at a younger age than adolescents in urban areas, particularly decisions in the social domain. Rural areas often have fewer educational and economic opportunities that could motivate young people to reconsider and postpone their social aspirations. Therefore, extending the age limit beyond the age of 21 in Sironko would potentially allow the inclusion of respondents who have already reached life-determining achievements or experienced life-determining incidents such as marriage or getting children.

During the interviews, we collected stories on how young people and those around them experienced trade-offs between their economic aspirations and several alternatives in their attempt to improve their future lives. The economic aspirations that were referred to during the interviews revolved around wealth, independence, autonomy, and nurturing of others, while their alternatives addressed issues of marriage, fertility, education, sense of belonging, peaceful relations, and community

engagement. Respondents also explained how they experienced competition between them. From this, we distilled a selection of three pairs of *competing* aspirations that both girls and boys in Uganda experience in their daily lives. [13] In each of the pairs, the aspiration to become economically independent stands central and competes with an alternative aspiration in the social sphere: the aspiration to have peaceful relations with family, the aspiration to live in the proximity of family and friends, and the aspiration to engage in the wider community. The three competing social aspirations all share a communal component (i.e. focused on friends, family, or community), which helps with the relevance of the selected instruments and the identification of possible peer effects in the third section of this paper.

In a second stage of the fieldwork period, we conducted a questionnaire that included questions on the pairs of aspirations and questions on socioeconomic background. The questions on the pairs of aspirations invited the respondents to allocate ten fictive tokens over the two aspirations in one pair, allocating more tokens the stronger they preferred one aspiration over the other. As a result, responses have cardinal properties that not only reveal which aspiration is preferred over the other but also captures the intensity of the preference. When both aspirations are perceived as good alternatives, interdependent valuation allows respondents to indicate one aspiration is considered the better of two, without discarding the opportunity also to allocate a value to the second-best aspiration. Without this imposition, participants could potentially have reported high aspiration levels on every dimension included in the questionnaire, irrespective of one another, which could have led to invalid responses. The number of tokens that could be allocated ranged from 0 to 10. Although such a precise valuation of alternatives is cognitively demanding, eleven answer categories ensure best measurement validity for contingent valuation, resulting in the highest consistency of answers and lowest levels in transitivity compared to nine or

[13] In the open-ended interviews, the respondents reported a total of six alternative aspirations to economic independence. For identification reasons this paper only focuses on peaceful relations with family, the proximity of family and friends, and community engagement, as they share a communal component. Consequently, this paper does not assess endogenous peer effects in marriage, fertility, or education. Moreover, we expect the three selected pairs to be the most relevant to the students (as evidenced by the individual fixed effects regression results presented in Chapter 2 of this thesis), which means that students are believed to interact with other students on these three trade-offs more frequently than on other trade-offs.

seven scale points (De Beuckelaer et al., 2013). In addition, the numerical values of tokens were not given ordinal labels to guarantee responses held their cardinal properties.

The questionnaire also elicited the perception of students on the level of competition between the two aspirations paired together. Using a five-point Likert scale with ordinal labels, ranging from completely disagree (1), to completely agree (5), we aimed to triangulate the results from the open-ended interviews and examine whether participants' perceptions were corresponding with the conceptualisation that aspirations compete with each other. Per pair, a question on the level of competition preceded the allocation of coins.

To investigate the effects of social interactions on aspirations, friendship ties were elicited with the help of an exhaustive list of classmates. Students were asked to indicate whom of their classmates they considered close friends by putting marks behind their names.[14] We did not impose a maximum limit on the number of close friends, which allowed us to capture the entire friendship network of each respondent. By capturing the entire friendship network, we expected to improve the identification of peer effects.[15]

The questionnaire, the description of paired aspirations, the wording of the questions, and response categories were tested extensively with adolescents before presenting them to the sampled respondents. An overview of the pairs of aspirations and descriptions can be found in Appendix A.4. An example of the friendship ties questionnaire is presented in Appendix B.1.

[14] When we elicited the friendship ties among students, we also aimed to elicit 'aversive' ties. We asked participations also to indicate with whom they could not get along with in their class, to investigate whether conformity would work the other way around for such ties. In practice, this turned out difficult to implement as students did not report many aversive ties, most likely because they did not want to be disloyal on any of their classmates to outsiders (e.g. enumerators).

[15] We did not make use of images or photographic material and considered lists with the names of students sufficient for respondents to identify their friends for two reasons. First, respondents were students in their final year of high school and were expected to be literate, and second, we asked them about their relationship with other students with whom they interacted in a delineated space (the classroom) on a daily base, instead of asking about relationships with others in a less delineated space like a village or town with whom they may have interacted on a less frequent base.

3.3.2. Sampling

In our sampling procedure, high school classes are the sampling unit. We define a class as a formalised group of students enrolled in a particular form at school. We randomly selected eleven Ugandan high school classes from a sampling frame that lists all sixth form high school classes in the Mbale district and Sironko district. The focus on school classes has several advantages when measuring peer effects in aspirations. First, the sixth form classes consist of students that soon need to make life-determining decisions but have not yet accomplished life goals like owning a business, getting children, getting married, or obtaining tertiary education. This makes their aspirations very relevant, as they will not justify the accomplishments they have had or the decisions they have made in the past. Second, schools provide an environment wherein students interact with a fixed, distinct set of peers (e.g. self-contained network). Peer effects can only be examined when the information about the network is accurate and complete, requiring the full participation of the entire population. Third, as pupils are physically present at school most of their time, therefore mainly interacting with classmates, adolescents' aspirations are expected to be strongly influenced by classmates' aspirations (social interaction effect). Also, existing survey data suggests that the vast majority of young people selects their most important peers from the schools they are enrolled in (Gaviria & Raphael, 2001).

We elicited the aspirations and friendship ties of 538 students at the school location. We also collected information on important socioeconomic characteristics like gender, family structures and household wealth. The questionnaire was self-completed in the interview room at the school location, and we did not let more than six students enter this room at the same time. After a student completed his or her questionnaire, a new respondent was invited, so the number of respondents in the room would never go beyond six. Survey questions were posed in English, and participants took approximately 90 minutes to answer all questions. Two Ugandan enumerators invited students into the interview room and provided instructions and assistance when filling in the questionnaire.

3.3.3. Identification strategy: the use of non-overlapping peers

We estimate the peer effect by making use of a modified version of the linear-in-means model of social interactions, originally introduced by Manski (1993):

$$Y_i = \alpha + \beta \bar{Y}_{-i} + \gamma X_i + \delta \bar{X}_{-i} + \mu_c + \varepsilon_i, \qquad E\,[\,\varepsilon_i \mid \mathbf{x}\,] = 0. \tag{2}$$

Here, Y_i is the score on one aspiration in a pair of aspirations of individual i. Individual characteristics of individual i are collected in vector X.[16] In addition, we assume that aspirations are also influenced by the interactions of individuals in friendship networks, in the following two ways. First, the contextual effects, which are the exogenous characteristics of peers, may have an indirect influence on an individual's aspiration level through its effect on peers' aspirations. For example, individual i's economic aspirations may not only be affected by individual i's own household wealth, but also by the average household wealth of the peers. Peer characteristics are then measured as individual i's network averages (i.e. the average characteristics of individual i's friends) of vector X minus the individual and illustrated as $\overline{X}_{-i}$.

Second, the endogenous peer effect, which is the average aspiration level of peers, influences individual aspirations directly. The average aspiration levels of peers, not including the scores of the individual, are labelled $\overline{Y}_{-i}$. The extent to which individual aspirations are influenced by those of peers is then represented by β, which is the peers' effect we are interested in. If the estimate of β is positive, a change in the aspiration levels of individuals within a reference-group would be predicted to spill-over to other individuals in the same reference group (e.g. social multipliers).

Both the contextual effect and the endogenous peer effect are social effects, but they suggest different policy interventions. The endogenous peer effect provides the possibility of social multiplier effects, where a change in an individual's set of aspirations spills over to peers. The effect of a policy intervention can then spill-over from treated individuals to non-treated individuals, while exogenous effects point out

[16] We treat the underlying concept of assigning importance to aspirations as continuous, and intervals between the 11 answer categories as equal. Therefore, the cardinal responses allow ordinary least squares regression as analysis technique.

that a change in group composition can have an effect on the aspirations of individual i.

When estimating both social effects, we also need to take account of the correlated effect (also called the confounding effect), which implies that individuals face a similar institutional environment which allows a set of network invariant unobserved characteristics to influence both an individual's and peers' aspiration levels. For example, students are exposed to the same school policies, have lessons from the same teachers, and students' families may base the choice of school to send their children to on the same unobserved factors. Moffitt (2001) states this is not a social effect and needs to be controlled for to avoid biased inferences about the relevance of social influences that arise from social interaction: the endogenous peer effect estimate will most likely be overestimated. Although it seems unlikely that selection of schools by families would be based on aspirations, the selection of friends within schools may be. Friendship ties could, therefore, be based on factors plausibly correlated with aspirations, such as similar levels of household wealth, family composition, or age.

To control for correlated factors (i.e. network invariant unobserved variables), class-level fixed effects are represented in μ_c. Each class is considered a fixed entity in which friendship networks are formed. For this model with class-level fixed effects to work, we must assume $[\ \varepsilon_i \mid \mathbf{x}\ ] = 0$, implying all regressors are exogenous and class-level unobservables that have an effect on the aspirations of individual i and the aspirations of i's friends are absent.

The linear-in-means model as proposed in equation (2), however, does not solve the reflection problem first suggested by Manski (1993). The reflection problem points out simultaneity of aspiration levels of interacting individuals in a group. It implies that the mean aspiration levels of a group and the individual belonging to the group move in the same direction, which poses a challenge to distinguish between the various social effects in equation (2). Not correcting for the reflection problem would lead to an overestimation of the endogenous peer effect.

In addition to this reflection bias, the linear-in-means model in equation (2) also does not solve the exclusion bias, first mentioned by Guryan, Kroft, and Notowidigdo (2009). Caeyers and Fafchamps (2016) elaborate further on this bias and point out that it stems from the non-random assignment of friends, as an individual i cannot be included as their own friend. They explain that the exclusion of the

individual i in the potential group of friends (i.e. the classroom) leads to a negative mechanical relationship between i's aspiration and the aspiration of potential friends in the classroom (as the pool to select friends from). If i has a higher aspiration level than the average aspiration level of the classroom, the average aspiration level of the remaining potential friends in the classroom is lower than i. If i has a lower aspiration level than the average aspiration level of the classroom, the average aspiration level of the remaining potential friends in the classroom is higher than i. It leads to a negative correlation between individual i's aspiration level and the average aspiration level of friends that are eventually nominated to be friends (Caeyers & Fafchamps, 2016). Using ordinary least squares as estimator as suggested in the linear-in-means model in equation (2) will then result in a downward bias because of the negative mechanical relationship.

To solve the reflection bias and the exclusion bias, we use the approach suggested by Bramoullé et al. (2009) which demonstrates that partly overlapping networks (i.e. variation in reference groups) allow the identification of endogenous effects. To explain this approach in more detail, we label the individual i as ego from here on. Each ego has an individual-specific social network, also called the reference group, and ego's aspirations are shaped by their friends' aspirations, but also indirectly through the aspirations of their friends' friends. In the absence of correlated effects, the presence of intransitive triads (the friends of ego's friends who are not ego's friends) in ego's network is a condition for the identification of social effects. Therefore, we extend model (2) and change the model into a matrix form:

$$\mathbf{y} = \alpha\tau + \beta\mathbf{G}\mathbf{y} + \gamma\mathbf{x} + \delta\mathbf{G}\mathbf{x} + \mu + \varepsilon, \qquad E\,[\,\varepsilon \mid \mathbf{x}\,\mathbf{G}\,] = 0. \tag{3}$$

In equation (3), $\mathbf{G}$ is an n × n interaction matrix for n students in the network, with $\mathbf{G}_{ij}$ =1 if student i and student j are friends, and $\mathbf{G}_{ij}$ = 0 otherwise. Individual characteristics are collected in the n × 1 vector **x.** Class-level fixed effects are represented in μ which control for the correlated effect and sorting of students into classes. We assume that including class-level fixed effects also simultaneously captures any unobservable influence experienced by ego and its non-overlapping peers. Instrumenting the aspirations of ego's friends with the exogenous socioeconomic variables of the non-overlapping friends of ego should therefore also

capture any correlated effects at the level of friends. Under equation (3), ε is independent from $\mathbf{x}$ and $\mathbf{G}$, but not independent or uncorrelated with $\mathbf{y}$, and thus also with $\mathbf{Gy}$ (Goldsmith-Pinkham & Imbens, 2013). However, the parameters $\alpha, \beta, \gamma \; and \; \delta$ are only identified when E [ε | $\mathbf{x}$] = 0 (no correlated effects), and when we apply restrictions on the interaction matrix $\mathbf{G}$ of a single network: First, the restrictions require that $\mathbf{G^2x}$ correlates with $\mathbf{y}$ through $\mathbf{Gy}$. Second, the restrictions necessitate injectivity, which means that the interaction matrix needs to be exogenous and cannot include mutually-exclusive groups nor fully-overlapping groups of friends. Each network of friends needs to be individual-specific (i.e. each network of friends is unique) and cannot fully overlap with other networks, which allows individuals that are not ego's friends to be included in the network as friends of other friends. To address simultaneity and get an unbiased estimator for β, we need to compute the reduced form of equation (3):

$$\mathbf{y} = \alpha(\mathbf{I} - \beta\mathbf{G})^{-1}\tau + (\mathbf{I} - \beta\mathbf{G})^{-1}(\gamma\mathbf{I} + \delta\mathbf{G})\mathbf{x} + (\mathbf{I} - \beta\mathbf{G})^{-1}\varepsilon. \qquad (4)$$

Here, $\mathbf{y}$ is a vector of aspiration scores for the classroom $\mathbf{I}$ (identity matrix) and τ the corresponding n × 1 vector of 1s. We follow Bramoullé et al. (2009) who demonstrate that, as critical rank restriction, the model is identified if and only if $\mathbf{I}, \mathbf{G}, \text{and } \mathbf{G^2}$ are linearly independent (so no bipartite network where each individual is directly linked to all other individuals and friends are overlapping), and the network does not partition the population. $\mathbf{G^2}$ then captures the friends of friends' interactions**.** It implies that E [ε | $\mathbf{x}\,\mathbf{G}$] is not perfectly collinear with $\mathbf{Gx}$, meaning $\mathbf{G^2x}$, $\mathbf{G^3x}$, etc. are valid instruments for ego's friends. As we only include the socioeconomic characteristics of friends of friends who are not ego's friends in $\mathbf{G^2x}$, the covariance characteristics are unlikely to correlate with the error term. This is the exclusion restriction imposed. Moreover, Caeyers and Fafchamps (2016) explain that adding i's value for the instrumental variables included in $\mathbf{G^2x}$ successfully removes exclusion bias that could lead to underestimating the peer effect of $\mathbf{Gy}$. As the exogenous characteristics included as instruments in $\mathbf{G^2x}$ are averages of ego's friends' friends which correlate with $\mathbf{Gy}$, then i's values of the instruments should also correlate with $\mathbf{y}$**.** In the second stage of the IV/2SLS, the covariance between $\mathbf{Gy}$ and i's own value of the instrument should be 0 (Caeyers & Fafchamps, 2016, p. 26).

Also, the class-level fixed effects included in equation (3) do not deal with correlated effects at the friends level (i.e. sorting into friendship networks), but only with sorting into classes. However, as we instrument $\bar{Y}_{-i}$ with $\mathbf{G^2x}$, we also deal with correlated effects at the friends' level, as the characteristics of non-overlapping friends are not expected to correlate with the characteristics of the ego. To control for possible correlated effects at the class-level, which include potential correlated effects at the individual network level, each class should consist of one interconnected network. We will test this assumption in the empirical section.

For $\mathbf{G^2x}$, we use the average of eight exogenous characteristics of ego's friends' friends who are not ego's friends as a set of identifying instruments. As we use more instruments than we have endogenous regressors our model is overidentified. The set includes gender, a household wealth index score, a dummy for whether the individual belongs to the Gisu tribe, birth order, age, a dummy for whether the individual lives with both parents, a dummy for whether the individual has a romantic partner (i.e. boyfriend or girlfriend), and a locus of control index score.[17] As the same set of variables is also used to capture the effects of individual characteristics of the ego and as contextual effects (characteristics of the friends), we explain their expected relationship with aspirations first in light of how a change in the characteristics of ego may correlate with ego's aspiration level. After that, we explain how the same variables are used again to capture the contextual effects.

First, we include gender in our set of instruments because gender norms shape aspirations. Boys aspire to economic independence, while girls attach more relative importance to social alternatives (see Chapter 2 of this thesis on gender differences in economic aspirations). The average household wealth is also expected to have a positive effect on economic aspirations. The wealthier the household of ego, the more ego aspires to obtain economic independence. In addition, we add a dummy if ego is from the dominant Gisu tribe (1=Gisu tribe, 0=other tribe), which is anticipated to raise ego's economic aspirations at the expense of social alternatives. Gisu culture puts a strong emphasis on individual levels of independence and autonomy (Heald, 1998). Birth order is also considered a determinant of the aspiration to obtain economic independence. Individuals of either sex with a low birth order are expected to be

[17] The household wealth index is based on Filmer and Pritchett (2001). The locus of control index is based on Rotter et al. (1961).

among the first in line to marry and start a life of their own. On the base of this, we hypothesise that birth order correlates negatively with economic independence. We also expect the average age of ego to positively correlate with ego's economic aspirations. Older youngsters experience pressure to rely less on their social network and become more responsible for their own income generation. Moreover, we add a dummy for having a romantic partner (1=partner, 0=no partner). Having a partner could increase ego's felt necessity to become economically independent and start an independent life as a couple. Moreover, Dalton et al. (2018) shows that locus of control positively correlates with economic aspirations. An increased feeling of being in control of life could render ego's belief that living standards can be improved through obtaining one's own independence. Last, we add a dummy for living with both parents to our set of instruments (1=living with both parents, 0=other living arrangements). Living with both parents can highlight the importance of social aspirations like living near family and having peaceful relations with them. However, being a maternal, paternal, or full orphan, or living with foster parents like relatives or neighbours, can lower ego' social aspirations while raising the aspiration to become individually economic independent as alternative.

We use the same variables to capture the contextual effects, which capture a direct effect of the peers' characteristics on ego's aspiration levels, that do not work via the aspirations of ego's friends. For example, a large proportion of friends with a boyfriend or girlfriend in ego's peer group can have a direct effect on ego's economic aspirations, as he or she feels the necessity also to become more serious about an independent future and starts thinking about how to prepare for an independent life with a partner. Another example relates to the average household wealth of ego's friends. A relatively wealthy group of friends (on average) could stimulate ego's economic aspirations as he or she is encouraged by the wealth that friends and their households display (e.g. owning expensive mobile phones, a car or a motorcycle). In both examples, the contextual effect on ego's aspirations does not necessarily work via the aspirations of ego's friends.

3.4. Results

In this section, we present the results. In a first subsection, we present descriptive statistics on the individual exogenous variables of students, which also function as

contextual effects for friends. We also discuss whether the three pairs that we have drafted are considered competing, to examine whether our starting point of competing aspirations holds value. In a second subsection, we present the OLS regression estimates and the results of IV-2SLS and two-step GMM regressions, which estimate the peer effects using the non-overlapping peers' approach.

3.4.1. Descriptive statistics

Table 9 shows the average socioeconomic characteristics of the 538 students who participated in the study. Girls constitute more than a third of the sample, while Mbale based students make up slightly more than half of the sample.[18] The vast majority of the students indicate they belong to the Gisu tribe. On average, students are 20 years old which indicates that their aspirations and the trade-offs they experience between them can be very different from non-school going peers at that age. This holds especially for female students. What also stands out is that students have a relatively high birth order and only half of them still live with both parents. Moreover, half of the students included in this study indicate they have a romantic partner (i.e. boyfriend or girlfriend). We do not discuss household wealth and the locus of control measure here as they are indexed (computed using the first component of a principal component analysis), and their mean scores are centred around 0.

In terms of friendship characteristics, respondents report one fifth of all classmates as a close friend (i.e. 20% of all potential ties is reported as a friendship tie). In absolute numbers, this implies that a student nominates an average number of almost eleven close friends. In our initial dataset, 99.97% of the students are reported as friends by at least one other student, and 91% of the respondents have at least one other friend, confirming a nominated friendship tie. Nevertheless, only 30.67% of all nominated friendship ties are reciprocated by other students. As a result, using the reciprocated ties would cause difficulties with the non-overlapping peers' approach (i.e. for many students we would not find any non-overlapping peers, and their exclusion from the sample would lead to an impracticable small sample size), and we

[18] Although we make use of a stratified sample with rural/urban as dimension, the sample sizes of the two location subsamples are too small to examine endogenous peer effects in the two locations separately with IV/2SLS estimation and our set of instruments.

therefore only use the nominated friendship ties to investigate peer effects in aspirations. [19]

Table 9. Descriptive statistics of socioeconomic characteristics

Variable	Mean	SD
Mbale based	59%	-
Female	38%	-
Gisu tribe	69%	-
Birth order	3.80	2.84
Household wealth index (PCA)	0.06	2.56
Partner (i.e. boyfriend or girlfriend)	54%	-
Age (years)	19.67	1.52
Locus of control index (PCA)	0.01	1.26
Living with both parents	53%	-
Nominated friends*	10.84	10.52
Ratio class size / reported friends	19.93	17.51
Observations		538

Notes. *Minimum of nominated friends needs to be at least 1, as a student is otherwise an isolate in the network.

Per pair, the perceived level of competition between the aspirations is presented in Table 10. When comparing the mean scores of all three pairs, we find that pair 3 – economic independence vs community engagement – has been assigned the highest competition score out of a total of 5. The lowest competition score is assigned to the second pair where economic independence is paired with living near family and friends. The results of the one-sample t-test, where we test whether the competition scores are statistically significantly higher than the neutral value of 3 (which represents the ordinal label 'neither agree nor disagree'), reveal that all average mean scores in the three pairs are statistically significantly higher. Therefore, the one-sample t-test

[19] In total, 19 isolated students (i.e. no nominated ties) are removed from our dataset. Students are isolated if they do not nominate any friends in the classroom, and hence do not have a reference group. After deletion of the 19 isolates, we also deleted 1 student with no non-overlapping peers from the dataset. In addition, 31 students nominated only 1 outgoing tie which was reciprocated for 18 of these students but this was sufficient for the non-overlapping peers' approach to work.

results in Table 10 confirm our conceptual starting point that aspirations are competing.[20]

Table 10. One-sample t-test; perception of competition scores

Pair	Mean	SD
Economic independence - peaceful relations with relatives	3.56***	1.21
Economic independence - proximity of family/ friends	3.44***	1.22
Economic independence - active community member	3.67***	1.17
Observations		538

Notes. * p<0.1, ** p<.05, *** p<0.01. One sample t-test, with H_0: average conflict score = 3. Perception of competition scale ranges from 1 (totally disagree) to 5 (totally agree).

Table 11. Descriptives of aspiration scores

Pair	Mean*	SD
Economic independence - peaceful relations with relatives	5.12	2.17
Economic independence – proximity of family/ friends	5.29	2.15
Economic independence - active community member	5.49	2.14
Observations		538

Notes. * The mean scores for egos represent the average score assigned to the first aspiration of the pair.

Table 11 presents the mean aspiration scores of ego. Per pair, only the mean score referring to the first aspiration mentioned in the pair is presented, as the scores of paired aspirations correlate perfectly. The mean of the third pair where the aspiration to become economically independent is traded off against becoming an active community member has the most substantial difference in ego's scores between two aspirations. This is followed by the second pair where the aspiration to become economically independent is traded off against living near family and friends. The pair with the smallest difference is then the first pair where economic independence is

[20] We also find a strong correlation in pair 1 and 2 between the perceived level of competition and the level of outspokenness (i.e. distance from the neutral point 5, where both aspirations receive an equal weight) regardless of the aspiration preferred. This suggests that the more a respondent perceives the two aspirations as impossible to attain at the same time, the more it warrants preferring one aspiration over the other.

traded off against living in peace with relatives, which implies that the alternatives paired are aspired to more equally than in other pairs. Nevertheless, in all three pairs the aspiration to become economically independent is aspired over the three alternatives.

3.4.2. Average peer effects; OLS, 2SLS, and GMM

We run a linear-in-means model as proposed in equation (2) to investigate the existence of peer effects. This allows discussion of the 2SLS / GMM regression results with reference to the OLS regression results. To control for heteroskedastic standard errors in the OLS regressions, we bootstrap cluster the standard errors at the class-level in each of these models. We need to bootstrap cluster the standard errors because we only have a limited number of 11 clusters (i.e. 11 classrooms).

First, however, we need to test whether the class-level fixed effects are valid. Therefore, we graph nominated network ties for each of the 11 classes which are presented in Appendix B.2. Although substantially dense, the network graphs show that each class consists of one interconnected network without any non-connected subgroups of students. This ensures that we control for possible correlated effects at the class-level, which include potential correlated effects at the individual network level. If we would have had multiple non-connected networks per class, we should have controlled for correlated effects at the individual-specific network level using the first-difference approach.

In addition, based on our econometric specification in the third section of this paper, we have reason to believe that any OLS estimate is affected by reflection bias and exclusion bias. While both go in the opposite direction, it is important to correct for both of them as we do not know the size of these biases. To do so, we conduct an IV/2SLS regression and an IV/GMM two-step regression based on the model in equation (3), where we instrument friends' aspiration levels with the socioeconomic characteristics of the friends of friends who are not ego's friends (i.e. non-overlapping peers approach).[21] The IV/GMM two-step is a generalised methods of moments estimation method that can be used when a violation of the assumption of i.i.d. errors

[21] We use the xtivreg2 Stata module to perform IV/2SLS regression and IV/GMM two-step regression (Schaffer, 2015).

is expected. Compared to the IV/2SLS method, the GMM two-step method is better suited to make standard errors and test statistics robust to heteroskedasticity and intra-class correlation of unknown form. Wooldridge (2001, p. 91) explains that it generates more efficient estimates of the coefficients by creating a weighting matrix after the first step of regressing the instruments on the endogenous regressor. The weighting matrix inverts a consistent estimator of the variance-covariance matrix of orthogonality conditions. When instrumenting the endogenous regressor with the instrument in a second step, the GMM two-step method gives less weight to moment conditions with relatively larger variance while giving more weight to moment conditions with relatively smaller variance (Baum, Schaffer, & Stillman, 2007; Wooldridge, 2001).

The IV/2SLS and IV/GMM regressions exploit the structure of the social network and rely on the existence of intransitive triads and non-overlapping peers. However, Bramoullé et al. (2009) point out that when exploiting the structure of the network the density of the social networks and the degree to which all possible ties are nominated as friendship ties affect the strength of the instrumental variables, which in turn determines the quality and accuracy of the peer effect. So, if students in a classroom are very well-connected to others and nominate a large number of possible ties as close friends, the class network becomes substantially dense. Consequently, the number of intransitive dyads decreases, which means that the number of non-overlapping peers also decreases: the more friends an ego nominates in the classroom, the smaller the pool of remaining students becomes from which ego's friends can select friends who are not ego's friends. This weakens the exclusion restriction, making it challenging if not impossible to identify a possible peer effect with a local average model (Bramoullé et al., 2009). Altogether, estimating the endogenous peer effects more efficiently requires relatively small-individual-specific networks, which is supported by the studies of L.-f. Lee (2007) and Boucher et al. (2014).

Discussing the influence of network density on the identification of the peer effects in relation to our study design is relevant, as we allowed respondents to nominate as many friends as possible. Unlike some peer effects studies like Fortin and Yazbeck (2015), Trogdon, Nonnemaker, and Pais (2008), Calvó-Armengol, Patacchini, and Zenou (2009) and Lin (2010), who make use of the National Longitudinal Survey on adolescent health in the United States where the number of nominated ties are restricted up to five male and five female friends, we did not restrict

respondents to a maximum number of ties they were allowed to nominate. We considered capturing all social interactions in a classroom fundamental to our approach, as the identification of the local average model requires full network inclusion. Another advantage of capturing all ties is that it allows for the inclusion of different levels of network density per class, as some classes are better connected than others. L.-f. Lee (2007) shows that identification of peer effects with fixed effects (a within analysis) relies heavily on varying group sizes (i.e. each ego in the class has a different number of outgoing ties). The opportunity to report all possible ties is then more likely to guarantee different group sizes than putting a maximum on the number of friends. Moreover, the effect of exclusion bias is believed to be smaller in large individual-specific friends networks, as removing the aspirations of ego from the mean has a greater effect if ego has only a few friends compared to many friends (Boucher et al., 2014).

Altogether, not using a maximum for the number of nominated ties resulted in our study in an average number of almost eleven outgoing ties per ego (see Table 9), which equals to nominating approximately 20% of all students in the classroom as close friends. The relatively dense networks per class that result from this may affect the strength and relevance of our instruments, together with the number of instruments needed for sufficient identification, which could lead to a biased and imprecise estimation of a peer effect. Alternatively, instead of the nominated ties we could have used the reciprocated ties to reduce the network density per class. Reciprocated ties can potentially improve identification, but as only less than one third of the ties are reciprocated in our study, this approach would exclude students with no reciprocated ties leading to a sample size that is too small for instrumental variable estimation to be useful.

With the role of network density in mind, we first discuss how the eight instruments that we have selected correlate with the average aspiration level of ego's friends as the endogenous regressor. Table 12 presents the first-stage results of the IV/2SLS estimation (this first step is similar for 2SLS and GMM) for each of the three pairs of aspirations. In each regression, we use class-level fixed effects. Appendix B.3 presents a complete overview of the first-stage results, including the individual characteristics and the contextual effects, which we have left out of Table 12.

Table 12. Regressing instruments on endogenous regressor (1st stage IV/2SLS)

	Pair 1	Pair 2	Pair 3
Dep var = aspiration level friends	Economic independence – peaceful relations with relatives	Economic independence – proximity family/friends	Economic independence – community engagement
Instruments (characteristics of non-overlapping peers)			
Gender	-0.138	-0.746**	-0.319
	(0.413)	(0.357)	(0.362)
Wealth index (PCA)	-0.286***	-0.349*	-0.300*
	(0.090)	(0.190)	(0.154)
Gisu tribe	0.091	-0.318	-0.485
	(0.658)	(0.389)	(0.474)
Birth order	0.090	0.162*	0.194
	(0.064)	(0.089)	(0.136)
Age	-0.232	-0.309	-0.293
	(0.220)	(0.222)	(0.233)
Partner	0.112	0.191	0.999***
	(0.386)	(0.435)	(0.292)
Locus of control (PCA)	0.095	-0.512**	-0.068
	(0.187)	(0.207)	(0.283)
Live with both parents	0.669	0.316	0.642
	(0.445)	(0.551)	(0.501)
Characteristics of ego	Yes	Yes	Yes
Contextual effects	Yes	Yes	Yes
Constant	13.712***	12.860***	13.641***
	(5.166)	(4.786)	(5.108)
R^2 within	0.094	0.120	0.117
Observations	538	538	538

Notes. * p<0.1, ** p<.05, *** p<0.01. Bootstrap clustered standard errors at the class-level and in parentheses. Class-level fixed effects used. The coefficients reported relate to the first aspiration mentioned per pair. For the second-mentioned aspiration in the pair, the results are exactly the opposite. The contextual effects include the full set of characteristics of friends.

Looking at the instruments that have an effect, we find that in the first pair of aspirations where economic independence is traded off against peaceful relations with family, household wealth has a statistically significant negative effect. This means that ego's friends lower their aspiration to become economically independent when the average household wealth level of their friends increases. In the second pair of

aspirations, we find that gender has a negative effect on economic independence. The coefficient of -0.746 implies that an increase in the proportion girls of non-overlapping peers with 1 unit decreases ego's friends' aspiration to become economically independent when traded off against the proximity of family and friends. The results of the second pair also reveal that an increase in the average locus of control score of non-overlapping peers with 1 unit decreases ego's friends' aspiration to become economically independent with 0.512 when traded off against the proximity of family and friends. In addition, we see that birth order and household wealth only marginally influence the aspirations in pair 2. The aspirations in the third pair are strongly influenced by the proportion of non-overlapping peers that has a romantic partner. An increase in that proportion of 1 leads to an increase of 0.999 in the aspiration to become economically independent when traded off against community engagement. In the third pair of aspirations, the regression results also show that household wealth of non-overlapping peers has a marginally significant negative effect on the economic aspirations of ego's friends.

The results in Table 12 show that per pair not all instruments have an effect on the endogenous regressor. The proportion of ego's friends' friends who are not ego's friends that is of Gisu tribe, that live with both parents, and their average age do not affect the aspirations of ego's friends in any of the three pairs. Appendix B.4 presents scatterplots for each pair of aspirations that show how the predicted values of the first stage correlate with the endogenous regressors.

Table 13 presents the results of the OLS regressions and the results of the second stage of the 2SLS, where we instrument the aspirations of friends with the characteristics of non-overlapping peers to allow comparison of the estimates. To interpret the validity of the endogenous peer effects estimated by IV/2SLS and IV/GMM, we need to examine the strength of the instruments. For IV/2SLS and IV/GMM the weak instruments test statistics are the same, as the test procedures for both estimation methods are the equivalent of an F-test from the first-stage regression with one endogenous regressor. Moreover, both methods use the same bootstrap clustered standard errors. We report a Kleibergen-Paap Wald rank F statistic (Kleibergen & Paap, 2006) per pair of aspirations at the bottom of each 2SLS estimation in Table 13. The Kleibergen-Paap Wald rank F statistic is based on the Cragg-Donald Wald F statistic and is appropriate when using (bootstrap) clustered standard errors. Studies on weak instruments when standard errors are not i.i.d have

not yet been conducted. As the threshold between strong and weak instruments depends on the type of violation of the i.i.d. assumption, which differs across studies (Bazzi & Clemens, 2013), critical values for the Kleibergen-Paap Wald rank F statistic have not yet been defined. Therefore, we apply the critical values normally used for the Cragg-Donald Wald F statistic, also because our model includes only one endogenous regressor, and use Stock and Yogo (2005) critical values to interpret the magnitude of the Kleibergen-Paap F statistic (Baum et al., 2007).

We also test whether the overidentifying restrictions are valid. To obtain the statistics for overidentification we need to partial out the individual characteristics of ego and the contextual effects (i.e. characteristics of ego's friends) using the Frisch-Waugh-Lovell Theorem as our covariance matrix is not of full rank (Frisch & Waugh, 1933; Lovell, 1963).[22] The Sargan-Hansen J statistic in Table 13 represents the test of overidentification. The null hypothesis of this test states that the overidentifying restrictions are valid and that the excluded instruments are correctly left out of the reduced form of the model (Baum, Schaffer, & Stillman, 2010). This is crucial, as our identification strategy relies heavily on the exclusion restriction that excluded friends of friends who are not ego's friends do not influence ego's aspirations other than influencing the aspirations of ego's friends.

Last, we examine whether the coefficients of the OLS and IV/2SLS or IV/GMM regressions are statistically significantly different. For this, we use a robust Durbin-Wu-Hausman test of endogeneity. The null hypothesis of the test states that the endogenous regressor (i.e. average aspiration level of ego's friends) can actually be treated as exogenous. Therefore, if the test is significant and we reject the null, we should use the estimates from the IV/2SLS and IV/GMM regressions. If the test is not significant and we cannot reject the null, we should use the estimates from the more efficient OLS regression.

In the first pair of aspirations where economic independence is traded off against peaceful relations with relatives, the OLS estimate is not statistically significant. The coefficient for the endogenous peer effect is 0.770 in the IV/2SLS estimation and 0.760 in the IV/GMM estimation, and these coefficients are, albeit very similar in size, also not statistically significant. The Kleibergen-Paap Wald F statistic

[22] This problem results from having fewer clusters than exogenous regressors and instruments (Baum et al., 2007).

is below the Stock and Yogo (2005) critical value for the 10% maximal IV bias relative to OLS regression and below the 25% maximal IV size bias, which indicates that the instruments in our model are weak for pair 1. In addition, the Sargan-Hansen J statistic has a *p*-value of more than 10%, which means that the overidentifying restrictions are valid. Last, the non-significant endogeneity test statistic shows that in the first pair the null hypothesis cannot be rejected, meaning we should use the non-significant estimate of 0.022 from the OLS regression for the peer effect. On the base of this estimate, we have to conclude that students do not influence other students when trading off economic independence against living in peace with relatives.

Looking at the second pair of aspirations - economic independence vs proximity of family and friends - the OLS regression reveals a negative coefficient which is not statistically significant. However, both the IV/2SLS and IV/GMM estimation reveal a statistically significant positive peer effect. The peer effect in the second pair of aspirations implies that on a scale of 0 to 10, a shift of 1 in the average aspiration level of ego's friends causes a shift of 0.699 in ego's aspiration level in the same direction. The Kleibergen-Paap Wald F statistic of 33.426 in the model for the second pair of aspirations is above the 5% Stock and Yogo (2005) relative IV bias and between the 10% and 15% maximal IV size bias, and suggests that our instruments are strongly correlated with the aspiration levels of friends. Moreover, the Sargan-Hansen J statistic is not significant, which means that the overidentifying restrictions are valid, and we also reject the null hypothesis that the endogenous regressor is actually exogenous. This leads us to conclude that the IV/GMM estimate of the second pair is valid, precise and unbiased.

In the third pair of aspirations - economic independence vs community engagement - the OLS estimate is statistically significant at the 10% level. In addition, the IV/2SLS and IV/GMM estimates reveal a statistically significant endogenous peer effect at the 5% and 1% level, respectively. An increase of 1 in the average aspiration level of ego's friends leads to an increase of 0.988 in ego's aspiration level. The Kleibergen-Paap Wald F statistic of 15.442 is between the 5% and 10 % Stock and Yogo (2005) critical values and between the 15 and 20% maximal IV size bias. Also here, we conclude that our instruments correlate sufficiently with the aspiration level of ego's friends. The Sargan-Hansen J statistic has a *p*-value of above 10%, implying that the overidentifying restrictions are valid. In addition, the null hypothesis of the endogeneity test is rejected, meaning that we should treat the endogenous regressor as

endogenous. Altogether, we conclude that the peer effects estimate of the IV/GMM regression of our model for pair 3 is valid, the estimate is precise and unbiased.

When we compare the estimates of the three estimation methods, we find that the effects estimated with IV/2SLS and IV/GMM in Table 13 are higher than the effects estimated with OLS, which may seem surprising, as the latter is often biased upwards due to reflection bias, correlated effects, and endogenous peer selection (Manski, 1993). It seems that the exclusion bias is stronger than the reflection bias as the OLS estimates of the three endogenous peer effects are biased downwards, and the use of class-level fixed effects may have amplified the downward bias. According to Roodman (2009), the use of lagged dependent variables (i.e. the aspiration level of friends can be considered a lagged variable of the aspiration level of ego) with fixed effects has a downward bias on OLS estimation. When we use IV/2SLS and IV/GMM and also include the values of ego for the variables selected as instruments (e.g. if we include gender of the non-overlapping peers as instrument we should also include the gender of ego as control variable in our model), the negative exclusion bias that affects OLS estimates is accounted for (Caeyers & Fafchamps, 2016).

In addition, the use of class-level fixed effects in our estimation approach is crucial. When we do not control for correlated effects and leave out the class-level fixed effects, the IV/2SLS and IV/GMM estimates are larger for all peer effects and, apart from the estimates of the peer effect pair 3, significant at a smaller *p*-value. The regression results without class-level fixed effects are attached in Appendix B.5 for the OLS regressions and Appendix B.6 for the IV/2SLS and IV/GMM regressions. The results in Appendix B.6 suggest that aspirations may be influenced by correlated effects for which we need to control by adding class-level fixed effects.

In sum, the IV/GMM in Table 13 provide two statistically significant endogenous peer effects. The Sargan-Hansen J statistics demonstrate that the overidentifying restrictions are valid, the Kleibergen-Paap Wald F statistics indicate that our instruments are strongly correlated with the endogenous regressor, meaning our estimates of peer effects in pair 2 and pair 3 are precise and unbiased, and the endogeneity test statistics show that we should treat our endogenous regressors as endogenous. Altogether, our results deliver evidence for the existence of endogenous peer effects on the aspirations of high school students. In two out of three pairs, students influence other students when trading off economic aspirations with competing social alternatives.

Table 13. Average peer effects (OLS, IV/2SLS and IV/GMM)

	Pair 1			Pair 2			Pair 3		
Dep var = aspiration level ego	Economic independence – peaceful relations with relatives			Economic independence – proximity family/friends			Economic independence – community engagement		
	OLS	2SLS	GMM-2s	OLS	2SLS	GMM-2s	OLS	2SLS	GMM-2s
Aspiration level friends	0.022	0.770	0.760	-0.007	0.765**	0.699**	0.184*	1.061**	0.988***
	(0.130)	(0.665)	(0.555)	(0.097)	(0.385)	(0.319)	(0.103)	(0.469)	(0.350)
Kleibergen-Paap Wald F statistic		7.697	7.697		33.426	33.426		15.442	15.442
Sargan-Hansen J statistic [23]		10.313	10.313		5.484	5.484		7.442	7.442
Endogeneity test		0.490	0.490		4.237**	4.237**		4.416**	4.416**
Adjusted R^2	-0.018			0.017			0.014		
Observations	538	538	538	538	538	538	538	538	538

Notes. * p<0.1, ** p<.05, *** p<0.01. Bootstrapped standard errors at the class-level in parentheses. Class-level fixed effects used. Each regression controls for ego's own characteristics and friends' characteristics. Excluded instruments: 1) gender friends' friends, 2) birth order friends' friends, 3) household wealth friends' friends, 4) partner friends' friends, 5) locus of control friends' friends, 6) age friends' friends, 7) living with both parents friends' friends, and 8) Gisu tribe friends' friends.

[23] To obtain statistics on the overidentification test for all instruments we use the Frisch-Waugh-Lovell Theorem and partial out the characteristics of the individual and contextual effects as exogenous regressors (Baum et al., 2007).

3.5. Discussion of results

This section of the paper summarises the results and relates them to the existing literature on economic aspirations and on the technical aspects of estimating peer effects in social networks. First, we bring together the results and discuss their implications for development policy aimed at increasing economic empowerment of youngsters, where after we discuss the limitations of the study in relation to other peer effects studies.

The results obtained via the IV/2SLS and IV/GMM estimation methods provide evidence that students influence other students' aspirations in two of the three pairs of aspirations: we find endogenous peer effects in the weight students give to economic independence relative to the aspirations to live near family and friends and to engage with the wider community. No peer effects are found in the first pair, where students trade off the aspiration to become economically independent with the aspiration to have peaceful relations with family. However, the IV test statistics indicate that in the other two pairs we have sufficiently correlated instruments, valid overidentification, and have treated the endogenous variable as we should have, implying that the peer effects estimates are valid, precise, and unbiased.

The findings of this paper provide useful input for economic empowerment programmes aimed at lifting or changing the mindsets and aspirations of youngsters, in particular of those that are still in school. The presence of endogenous peer effects suggests that students included in these programmes can influence the aspirations of non-selected friends in the classroom: the effects of an economic empowerment intervention can potentially spill-over to those students who have not been part of the programme but are part of the social network of the student included. This means that for achieving results (i.e. a change in mindset, or increase of economic aspirations), not the entire class has to be included in the programme, and the inclusion of smaller subsamples of students can influence friends in the classroom, creating a multiplier effect. The results demonstrate that this holds especially for programmes that also address social empowerment issues, and teach on how to deal with pressures to obey social obligations in the community (e.g. to remain living in the area or to fulfil an engaging role in the community).

As we were mainly interested in the endogenous effects, we did not discuss the effects of the contextual variables in this paper, and how group composition has the

potential to influence the aspirations of the individual. Another, perhaps more convincing reason for not assessing the contextual effects relates to the type of contextual variables included in this study. Variables like gender, tribe, birth order and age are impossible to change, which means that in order to change the average characteristics of the group to raise aspirations, new groups of friends have to be defined (while other ties need to be severed). Although exposure to other students with specific characteristics that influence aspirations may potentially be useful, for example through the formation of extra-curricular groups (i.e. sports, religion, study, etc.), changing the group composition of friends in the classroom to raise the aspirations of youngsters seems to be an unrealistic intervention to implement in our research context. It would only bear relevance if educational policies insist on mixing classes on base of contextual effects, of which gender is the only feasible option. Altogether, this difficulty reaffirms the usefulness of the endogenous peer effects in aspirations for development programmes.

We do not find an effect for the pair of aspirations where economic independence is traded of against having peaceful relations with relatives. Conceptually, a plausible cause for the lack of an effect in the first pair is that the trade-off between economic independence and peaceful relations with relatives may be less relevant to school-going youngsters compared to the trade-offs represented in the other two pairs of aspirations. As a result, students may talk less about this trade-off, and consequently, do not influence each other's aspiration levels. The measure of competition between the aspirations paired that we have included in the survey indicates that the first pair is considered competitive and has not been assigned the lowest score in Table 10, but unfortunately, this does not capture the intensity of how relevant the trade-offs between the two aspirations paired together are for the students.

Furthermore, unlike most peer effects studies, we do not examine behaviour but individual attitudes that cannot be directly observed. For the average aspiration level of ego's close friends to have an influence on the aspiration levels of ego, we must assume that students discuss their aspirations explicitly with each other and convey their preferences to friends. Without direct and indirect forms of communication on aspirations the average aspiration level of friends is not perceptible, and peer effects cannot influence individual aspirations. Therefore, we have to assume that endogenous peer effects shape attitudes and aspirations but they may not be as strong as they are in shaping observable behaviour.

Moreover, the lack of an effect in the first pair should also be related to our identification approach. Table 12 shows that, apart from wealth, none of the instruments correlates with the endogenous regressor in pair 1, suggesting that our model is not sufficiently specified to identify a peer effect in this pair. In addition, despite having sufficiently large Kleibergen-Paap Wald F statistics in two of the three pairs of aspirations, and a Sargan-Hansen J test statistic indicating we correctly leave out the excluded instruments, we have overidentified our model by including eight exogenous variables of the non-overlapping peers as instruments in our model. Leaving out one of the eight instruments in any of the 2SLS approaches results in weak correlation of the instruments with the average aspiration level of friends. Therefore, the set of instruments as a whole leads to sufficient identification, but the instruments do not correlate strongly with the endogenous regressor individually, apart from a few as shown in the first stage in Table 12. One of the reasons is that instrumental variable estimation requires a relatively large sample size, and our sample size of 'only' 538 students may be too small. A second reason is the selection of instruments. In many studies that use instrumental variable estimation to find social interaction effects, identification of the instrument is challenging (Lin, 2010). An additional but highly relevant explanation is brought forward by Bramoullé et al. (2009) and revolves around network structure. Finding strong instruments in the non-overlapping peers' approach is dependent on the density of the social networks (i.e. the degree of all possible ties that are nominated as ties) and defines the quality of the peer effects. Instrument strength declines with network density, as the number of intransitive triads and the number of non-overlapping peers decreases. The more students in a classroom are connected, the smaller the number of non-overlapping peers, which makes identification more difficult. Also, L.-f. Lee (2007) suggests that an efficient estimation of the endogenous peer effects requires relatively small individual-specific network groups, which is further confirmed by the results of Boucher et al. (2014). In our study, we deliberately decided to put no cap on the total number of friends that students were allowed to nominate to capture all social interactions in a classroom: the identification of peer effects requires the full inclusion of the entire self-contained network. Consequently, however, identification in our study is largely dependent on network density, which could explain why we need to include eight instruments for sufficient identification.

3.6. Conclusion

Aspirations take shape during adolescence. During this period in life, youngsters start to develop an idea of what they could and would like to achieve in life. An important means through which youngsters' aspirations are shaped is through the peer influences of other classmates. The aspirations of friends in the classroom function as important reference points and help shape what is considered important and achievable in the future. More specifically, the local average model that is used in this study indicates that each student derives utility from his or her initial aspiration level (before social comparison). However, the average aspiration level of a student's group of friends functions as the main reference point and deviating from that average is costly; not conforming to the group's norm lowers the utility that a student derives from his or her aspiration levels. Therefore, a student aims to minimise the distance between the individual aspiration level and the average aspiration level of friends to maximise utility and avoid incurring costs.

To study how the aspirations of youngsters are influenced by their peers, this study elicits the aspirations of high school students in Uganda. There are three main reasons for studying the effects of fellow students. First, students interact with(in) a fixed set of peers, and peer effects can only be identified with the participation of the entire population. Second, students are physically present at school most of their time and are expected to interact more frequently with fellow students than with non-school going peers and third, young people mainly select their friends from their schools.

Through semi-structured interviews we draft a set of graded paired comparisons where the aspiration to become economically independent is paired with various alternative aspirations that compete for time, effort and resources. From this set we select three alternatives that contain a communal component: living in peace with relatives, living near family and friends, and engaging with the wider community. These alternative aspirations are largely shaped by social norms and obligations, and can hinder adolescents' economic empowerment. We elicit the aspirations of high school students using a questionnaire in which respondents are asked to allocate ten fictive tokens over a pair of aspirations. The distribution of tokens indicates the extent to which respondents prefer one aspiration over the other or whether they value the paired aspirations equally. The study also elicits the nominated friendship ties among all classmates.

Using the linear-in-means model, which does not account for the reflection problem, we observe one endogenous peer effect in the three pairs of aspirations, but the effect is only marginally significant. Implementing the non-overlapping peers' approach where we instrument the aspiration of ego's friends with the characteristics of the friends of ego's friends who are not ego's friends, the IV/2SLS and IV/GMM two-step regression results reveal endogenous peer effects in two of the three pairs of aspirations. The coefficients of the IV/2SLS and IV/GMM two-step regressions are higher for each pair of aspirations than the coefficients of the linear-in-means regressions, which implies that the OLS coefficients are biased downward. Despite the fact that we have dense class networks and relatively large friends networks with on average eleven class mates nominated as close friends, the regression results suggest that the exclusion bias in the OLS estimates is stronger than the reflection bias, which is further amplified by the use of class-level fixed effects.

Altogether, our regression results demonstrate that the aspiration level of ego's friends and ego's aspiration level move in the same direction, and an increase (decrease) in the average aspiration level of ego's friends leads to an increase (decrease) in ego's aspiration level. The existence of these endogenous peer effects in aspiration formation could be useful for development programmes that aim to lift the economic aspirations of adolescents. Both the local average model used in this study and our regression results suggest that the average aspiration level of the group to which an individual conforms to needs to be changed in order to change an aspiration at the individual level. To change that group average, the existence of endogenous peer effects in aspirations implies that not all members of the group need to be part of an intervention as aspirations may spill over to friends. This potential spill-over effect can make policy interventions more cost-effective, and with the same level of resources more people could be reached.

Chapter 4. Competitive versus destructive envy: experimental evidence from a real-effort experiment in Uganda

Abstract

Inequality generated by varying effort levels can create feelings of envy that reduce inequality either by stimulating competition (by trying to catch up with the best performers) or destroying the earnings of the best performers. Disentangling both effects is crucial to understand the costs and benefits of inequality for society. This paper disentangles the effect of competitive and destructive envy on effort, using a real-effort experiment in Ugandan high schools. Students perform a counting task in two consecutive rounds. In addition to a control treatment, we implement three treatments that provide relative performance feedback, money-burning, and the combination of both. Effort is operationalised as number of tables solved, number of correct answers, number of incorrect answers, and final earnings. Our results provide strong evidence that competitive envy (relative performance feedback) increases the number of correct answers and the final earnings, resulting in higher welfare. We also find evidence that destructive envy (the threat of money-burning) decreases the number of tables solved and the number of incorrect answers, but only when combined with relative performance feedback. Last, we find that household wealth of students influences both effects.

Keywords: envy, competition, effort, money-burning, real-effort experiment.

4.1. Introduction

Effort is crucial to escape poverty as it determines investments to improve social-economic conditions. It is influenced by comparisons with others, which can have a positive and negative influence. Exposure to successful, similar peers has proven to raise effort (Falk & Ichino, 2006), as social comparison evokes envy rendered into the ambition to 'keep up with others'. However, social comparison can also lead to another type of envy. Successful individuals may find themselves burdened by envious, less successful peers. In such circumstances, success has social costs and performing well could lead to social sanctions, and successful individuals may reduce their effort to avoid harassment (Di Falco & Bulte, 2011; Hadnes, Vollan, & Kosfeld, 2013). Grolleau, Mzoughi, and Sutan (2006) were among the first to divide both types of envy into competitive envy and destructive envy.

In this study, we disentangle the effects of both types of envy on effort to get more insight into the possible costs and benefits of inequality for society using a real-effort experiment. We design an innovative experiment that captures how successful individuals anticipate on destructive envy from less successful peers. The innovation of this study is manifested in an elaborate conceptualisation of effort. We look at the number of tables solved as the effort to work fast, the number of correct answers as the effort to work fast and accurate (i.e. dedication), and the number of incorrect answers, which covers the quality of effort. Another innovative element of our study is that we investigate how successful individuals anticipate on the envious behaviour of less performing individuals (i.e. people may dislike others for being better off), and how they adapt their effort. To the best of our knowledge, our study is the first of its kind to take account of anticipated a priori behaviour in a real-effort experiment. First, we focus on whether people care only about their absolute performance, or also about their relative position in their subgroup. Individuals may generate feelings of competitive envy if performance is low compared to peers' performance and try to reduce inequality by putting in more effort. The existence of such a mechanism can provide evidence that inequality can benefit and motivate the poor to catch up with successful individuals, who in return may want to outperform those directly under them. Second, we focus on a priori anticipated behaviour in the presence of destructive envy opportunities. Top performers may want to lower their effort if they anticipate that envious peers want to reduce their earnings, which reveals that destructive envy is costly. Successful individuals fear repercussions and lower effort, while less successful individuals spend resources on keeping income differences low. Altogether, investigating both types of envy provides a better understanding of how individuals trade off their desire for doing relatively well with wanting to avoid the destructive envy of others and the effect it has on their effort.

We set up a real-effort experiment with high school students in Uganda organised in groups of four students. The real-effort task we use is a counting task of zeros in tables made up of ones and zeros, and participants earn money with each table correctly solved (i.e. piece-rate compensation). We organise two-rounds: while the first round is the same for all participants, the second round is different, leading to the following treatments. In the first treatment, we provide feedback on the relative performance (correct answers, incorrect answers, and earnings in relation to three other players) of all four group members at the start of the second round, which we expect

would generate competitive envy as it allows participants to compare themselves socially. This allows investigating whether income inequality motivates low performers. In a second treatment, the second round starts with an announcement that earnings can be lowered (so-called 'money-burning') by fellow participants if they pay a price for this. This gives more insight into whether subjects anticipate fellow participants to engage in destructive envious behaviour and lower their effort to avoid the social cost of performing well. In a third treatment, we combine both elements to investigate how relative performance feedback either stimulates or supersedes the threat of destructive envy. In the control treatment, both rounds are the same so that we are able to capture any learning effects.

When controlling for effort imbalances in a first round and correcting the standard errors for non-independence within experimental sessions, we find evidence that relative performance feedback increases effort, demonstrated by an increase in the final earnings and an increase in the number of tables correctly solved. Our results do not show an effect of the threat of money-burning. However, when money-burning is combined with performance feedback, we find that the number of tables solved and the number of incorrect answers is substantially lower: the threat of money-burning lowers the output of participants in a second round only when previous performance is disclosed to other group members after a first round. This may point out that money-burning becomes only a credible threat once individuals realise how well they performed in a previous round. In addition, our results suggest that wealth influences both treatment effects. The poorest participants are motivated by relative performance feedback, whereas the wealthiest participants are demotivated by the threat of destructive envy, with and without the provision of performance feedback. This could imply that wealthier students anticipate others to take account of their wealthier background during the experiment.

Our study complements two strands of literature that investigate competitive and destructive envy, respectively. First, an increasing number of studies focuses on the positive effect of social comparison on effort in a wide variety of domains. Witnessing similar people succeed through effort may raise participants' perception that they hold comparable capabilities to master similar activities necessary for success, encouraging them to keep up with their peers (Bandura, 1993). Also, the joy of outperforming others (Dohmen, Falk, Fliessbach, Sunde, & Weber, 2011) and public recognition and dominance (Rustichini, 2008) may be fostered through social

comparison. Azmat and Iriberri (2010) and Carrell, Fullerton, and West (2009), for example, provide evidence that receiving relative performance feedback increases school performance. In addition, Mas and Moretti (2009) demonstrate that the introduction of highly productive workers leads to increased production of other personnel. In their study on performance rank and effort, Gill, Kissová, Lee, and Prowse (2018) show that individuals increase their effort the most when they are ranked first and last in their group, but the least when ranked in the middle of the group. Also, Herbst and Mas (2015) find that individuals put in more effort in the presence of their peers.

Second, social comparison can also lead to unethical behaviour and sabotaging of the proceeds of other's effort, and a second strand of literature investigates the effect of this on individual effort. Dow (1981) demonstrates that individuals in what he calls ’peasant’ societies reduced their effort to avoid social repression and envy from others. Bursztyn and Jensen (2015) show that students perform worse when fearing social punishment for trying too hard at school, and K. Lee, Duffy, Scott, and Schippers (2017) provide evidence that envy from others can elicit unpleasant mood and anxiety, negatively affecting job performance. Also, Kebede and Zizzo (2015) show that destructive envy limits investment in agricultural innovation in Ethiopia as potential profits are anticipated to be reduced by envious community members. Moreover, Charness, Masclet, and Villeval (2013) examine whether relative performance feedback stimulates subjects to cheat and engage in sabotaging the production of others. They assume that cheating is the result of a desire for having a higher rank, which is different from our explanation where we expect people in egalitarian societies to dislike others for being better off. Charness et al. (2013) also use a fixed-pay regime, while we use a piece-rate payment. Also, Grossman and Komai (2012) find evidence that envied individuals spend double the amount of resources on protection against envy than is spent on destructive envy by envious individuals, which highlights the overall cost of destructive envy.

Up until now, most studies on the effects of envy on effort examine the effect of one specific form. To the best of our knowledge, no study combines the effect of competitive and destructive envy on effort, apart from Charness et al. (2013) on French students. With regard to the latter type of envy, few studies examine the anticipation of the social cost of success and focus mainly on the act of destructive envy. Our study

bridges this gap in the literature, using a real-effort experiment in Ugandan high schools that allows us to disentangle the effects of both types of envy.

In the remainder of this paper, we present a review of the literature in section 2, followed by our experimental design in section 3. Section 4 shows and discusses the estimates of relative performance feedback and anticipated money-burning of group members on effort levels and analyses the heterogeneous treatment effects. Section 5 discusses the implications for development policy and section 6 concludes.

4.2. Literature review

4.2.1. Social comparison

In the economic literature, individuals are often assumed to base their actions primarily on self-interest. However, a substantial number of studies demonstrates that individuals are affected by others and care a great deal about their relative position in their reference group, which is eventually reflected in their well-being and behaviour. Bolton and Ockenfels (2000) develop a model to explain behaviour related to equity, reciprocity, and competition. They demonstrate econometrically that, next to pure self-interest, relative pay-off also motivates people. Moreover, E. Fehr and Schmidt (1999) use ultimatum and market games to show that some people are not only just pursuing self-interest, but are also driven by fairness considerations. They call this self-centred inequity aversion, which means that people are mainly interested in the fairness of their pay-off relative to others, leading inequity-averse individuals to behave very competitively. In addition, Luttmer (2005) uses survey data and shows that earnings of neighbours correlate negatively with self-reported happiness in the USA, which suggests that people's utility depends on relative consumption. Also, Solnick and Hemenway (2005) use American survey data to demonstrate that positional concerns are greater for income than leisure, and Pingle and Mitchell (2002) find in their survey data that especially younger, more competitive Americans are concerned about their income relative to the income of others.

This relationship between positional concerns and well-being is also tested in low-income countries. Results, however, are mixed, and highly dependent on context. Using survey data on Nepal, Fafchamps and Shilpi (2008) find a negative effect of the consumption of neighbours on how satisfied individuals are with their own

consumption, which is not moderated by wealth levels. They also show that more isolated households care more about the consumption levels of neighbours. Ravallion and Lokshin (2010) examine relative deprivation in Malawi using a household survey and find conflicting results. They define relative deprivation as the decrease in the utility of an individual's economic position relative to the average economic position of neighbours, and their results show that the well-being (i.e. 'satisfaction with life') of most individuals is not affected by the average well-being of neighbours. For the poorest individuals, economic welfare of neighbours even has a positive effect on their well-being, whereas the wealthiest individuals experience a negative effect of the economic welfare of neighbours on their well-being. In South Africa, Kingdon and Knight (2007) find similar results using a national household survey. Their analysis shows that relative income of individuals with similar race, but who are geographically distant, has a negative relationship with well-being (i.e. 'satisfaction with life') for individuals with higher levels of absolute income. For the poorest individuals, on the other hand, absolute income is more important for well-being than relative income. However, Akay and Martinsson (2011) use a similar approach in rural Ethiopia but do not find a relationship between relative income and subjective well-being.

In the previous paragraph, we focused on positional concerns on well-being, and we now discuss the relationship between positional concerns and behaviour. In this relationship, envy plays an important role, and envious behaviour can close the gap in performance between the individual and the reference group. In the next sections, we elaborate on competitive envy and destructive envy and the opposing effect they have on the relationship between social comparison and behaviour.

4.2.2. Competitive envy

When individuals observe similar, like-minded people having success through effort, they may increasingly become aware that they also have the ability to achieve similar success, which in turn motivates them to keep up with well-performing others (Bandura, 1993). But social comparison can also stimulate the joy of performing better than others and the quest for social recognition (Dohmen et al., 2011; Rustichini, 2008). As a result, social comparison positively impacts production.

Individuals can only compare themselves when they receive feedback on how their performance relates to the performance of peers. Various studies demonstrate the

effect of relative performance feedback on output like school grades and work productivity. Starting with the former, Azmat and Iriberri (2010) use a natural field experiment to show that the quarterly provision of report cards with an individual's grade average across all subjects and a class grade average across all subjects increases the annual average grade of Spanish high school students by 4.5%. Tran and Zeckhauser (2012) find similar results in their field experiment with Vietnamese students. Their findings show that informing students about their class ranking on practice tests increases grades more than when students are not informed, even when rankings have no direct, tangible benefits. In terms of work productivity, Blanes i Vidal and Nossol (2011) use a quasi-experimental design and show that daily disclosure of private information on the position in the distribution of pay and production leads to an increase of 6.8% in the production of German workers, even when it does not have direct financial benefits or better career possibilities. Moreover, Kuhnen and Tymula (2012) implement a lab experiment in the USA and show that individuals increase their productivity more when told they may receive feedback on their performance, even when they did not, relative to individuals who did not receive such an announcement.

However, the relationship between performance feedback and production is not always linear and depends on the rank in the performance distribution. Gill et al. (2018) conduct a real-effort experiment in the UK and demonstrate that the effect of rank-order feedback on effort provision is U-shaped, implying subjects work harder only when ranked first or last. Kuziemko, Buell, Reich, and Norton (2014) provide similar evidence using a lab experiment in the USA, showing that last placed individuals are more likely to take risks to move them out of last place. However, in cases where inequalities are too large, last-placed individuals may give up.

How individuals are rewarded for their effort moderates this relationship between rank and production. Azmat and Iriberri (2016) design and conduct a lab experiment in Spain and show that relative performance feedback only has an effect when individuals are compensated following a piece-rate compensation, and not when pay is fixed and independent of performance.

The differing effect of performance rank on effort points out different ways through which competitive envy has an effect on behaviour, and Roels and Su (2014) suggest two behavioural mechanisms. First, in behind-averse behaviour, people compare themselves upwardly and try to keep differences between them and those that perform better small. Agarwal, Mikhed, and Scholnick (2018), for example, link data

on lottery winners with credit data and data on bankruptcy of Canadians living in the same postcode. They demonstrate that a neighbour who wins the lottery increases subsequent borrowing and bankruptcy among other neighbours as a result of conspicuous consumption to keep up with successful (lottery winning) neighbours. Also, Linssen, Van Kempen, and Kraaykamp (2011) find evidence for behind-averse behaviour. They use household survey data to show that individuals motivated by positional concerns in low-income households in India consume conspicuous goods to keep up with others in their social environment. Individuals that spend more on conspicuous consumption also report lower scores of well-being.

Roels and Su (2014) mention ahead-seeking behaviour as the second mechanism by which competitive envy motivates production. People compare themselves downwardly and try to increase the gap between them and those that perform worse. Bursztyn, Ferman, Fiorin, Kanz, and Rao (2017), for example, use three field experiments to investigate the use of platinum credit cards in Indonesia. In a first experiment, they find that the demand for platinum credit cards exceeds the demand for an unmarked alternative with equal benefits. They also find that the platinum cards are primarily used in visible, social situations. In a second experiment, they demonstrate that the demand increases when more people are believed to use it, which reveals behind-averse behaviour. However, high-status costumers start ignoring the product and move to more exclusive options, which is a clear-cut example of ahead-seeking behaviour.

4.2.3. Destructive envy

Some studies empirically demonstrate that individuals do not always compete with each other, but also engage in destructive envious behaviour when opportunities are provided. An example already mentioned in the introduction is the study by Charness et al. (2013) who find that relative performance feedback on rank increases effort on average, but when sabotage opportunities are offered participants cheat and sabotage the work of other participants. Furthermore, Henrich et al. (2006) conduct three behavioural field experiments with 15 diverse populations in North and South America, Africa, Oceania, and Asia. The first experiment comprises an ultimatum game, the second experiment is a third-party punishment game, and the final experiment is a dictator game. Especially the results of the punishment game provide

evidence that in cases of less-equal offers, punishment happens across all groups, implying that destructive behaviour is occurring in every society included in the study.

The study by Bursztyn and Jensen (2015) is among the few that analyse the anticipated effect of destructive envy. The authors use a natural experiment, where the tabs in an online screen of a computer-based learning system would show the top 3 performers by name, class, and school after an online exam. As a result of this, students' performance drops with 24% when information on ranking performance is publicised, mainly because of fear for social punishment from classmates for doing too well in school. In a second field experiment, the authors investigate the influence of publishing the decision to sign up for an additional preparatory course. The number of non-honours students who were told that other students in the room would be informed about their decision to enrol in the course was 11% lower than non-honours students who were told that other students would not find out about their enrolment decision. Their study shows that educational investment carries social costs, especially for students who care about social status and popularity.

In addition to the cost of performing well, the results from various money-burning experiments reveal that people are even willing to pay a price to reduce fellow participants' revenues. Zizzo and Oswald (2001) show that especially less performing peers reduce the earnings of better performing fellow participants in the UK. Moreover, Kebede and Zizzo (2015) investigate the effect of envious behaviour in Ethiopia and find that it correlates negatively with agricultural innovation at the village level. To investigate whether growing inequality affects money-burning behaviour D. Fehr (2018) combines a real effort task with a money-burning design. He finds no inequality effect and concludes that the money-burning decision depends mainly on how participants generated their income during the effort task. Only when income was believed to be generated unfairly, mainly because the best performing participants received a bonus at the end of the experiment or were allowed to cheat, more money-burning took place.

Altogether, the existing literature demonstrates that individuals are interested in the relative position in their reference group. Numerous studies show that relative performance feedback allows people to socially compare themselves, which translates into competitive envy that increases production to reduce inequality. There are also studies that show that inequality stimulates destructive envy, leading individuals to engage in sabotaging activities to reduce the earnings of peers. We aim to combine

both strands of literature by designing a real-effort experiment that allows us to examine the effects of both types of envy simultaneously. We also propose a more elaborate definition of effort, which is often limited to earnings only.

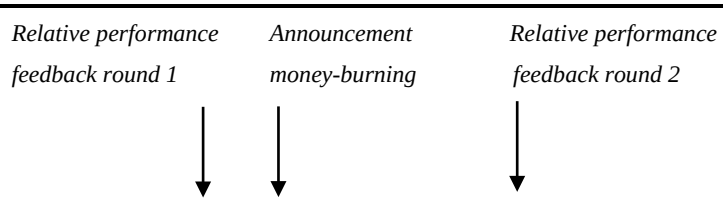
4.3. Experimental design

4.3.1. Real effort experiment

For our real-effort experiment, we make use of a between-subject design with two rounds of effort. Figure 2 illustrates a schematic design of the real-effort experiment and indicates the sequence of events. The first round is the same for all participants, and each participant is asked to perform the same effort task. The second round, however, is different, resulting in the following treatments. We use a first treatment (T1) where both rounds are completely similar as control to capture individual learning effects (as measured by changes between both the two rounds).

In a second treatment (T2), relative performance feedback is provided at the start of the second round, aimed at generating competition among participants that could increase their effort. The content of the feedback allows them to compare their performance in the first round with each of the three other group members.

Figure 2. Design real-effort experiment



	Round 1	Round 2			Money-burning		Pay-out
T1	Real effort task	0*	0	Real effort task	0		Random sampling round
T2	Real effort task	X	0	Real effort task	0		Random sampling round
T3	Real effort task	0*	X	Real effort task	X	Money-burning	Random sampling round
T4	Real effort task	X	X	Real effort task	X	Money-burning	Random sampling round

Notes. * In treatment 1 and 3, participants receive feedback on individual performance before the start of the second round. X means that a particular design feature (e.g. announcement money burning) was part of a treatment, 0 means that it was not.

Participants in a third treatment (T3) start the second round with the announcement that all participants will be offered the opportunity after that round to lower fellow participants' earnings of the second round if they are willing to sacrifice a part of their earnings for it. Participants need to pay 10% of the total amount they want to reduce from others.[24] For instance, if participant X decides to reduce a fellow group member's earnings with 1,000 UGX, a fee of 100 UGX will be deducted from participant X's second-round earnings. Money-burning decisions cannot affect any participant's earnings in round 1. Therefore, participants are only informed at the beginning of round 2 about the money-burning opportunity, also to avoid any interference with the effort invested in the first round. This threat of money-burning from fellow participants is expected to lower effort invested in a second round as better-performing individuals may anticipate that they could be targeted by worse-performing group members for performing well. However, as participants in the third treatment do not receive relative performance feedback at the start of the second round, they do not know how they rank compared to fellow group members, and whether they belong to the better performing or worse performing participants on base of earlier performance (round 1).

In a fourth treatment (T4), we combine the performance feedback and money-burning interventions. While participants in the second and fourth treatment receive information on their *relative* performance, participants in the first and third treatment receive feedback on their *individual* performance. Adding the provision of *individual* performance feedback to the other two treatments is necessary to attribute any potential treatment effect to the relative performance feedback (i.e. social comparison). Per treatment, participants are sampled into sub-groups of four participants.

We consider a counting task the most appropriate for the research context. The task entails counting the number of zeros in a table of 110 (11x10) randomly ordered zeros and ones, and answers need to be written in a designated space above the table. See Appendix C.1 for an example. The format and dimensions of the table were extensively tested at a number of high schools in the research area. No prior knowledge is required to perform a counting task, performance is easy to measure, learning effects are relatively low, and the task is considered pointless, implying that task-fulfilment entails a positive cost of effort for participants.

[24] Consistent with Kebede and Zizzo (2015).

In each round, participants have precisely 10 minutes to solve as many tables as possible, and earnings are based on a piece-rate compensation scheme. All participants receive a similar set of 25 tables per round. Although the sets of the first and second round are different, the ordering of the tables (i.e. table 1, table 2, table 3, etc.) per set is similar for each participant, and no feedback on performance is given during the effort task. Even though participants are rewarded for the number of correct answers, the number of incorrect answers is also recorded. Each incorrect answer infers a penalty on the earnings to discourage guessing (i.e. filling in answers randomly during the exercise hoping to guess the correct answer and earn 500 UGX without putting the necessary effort in).

The relative performance feedback in treatments two and four provided at the start of the second round discloses the number of correct answers, the number of incorrect answers, and earnings (not including the show-up fee) and is individually specified for each of the four group members. The individual performance feedback in the first and third treatment contains the same three elements but does not disclose information on group members' performance. After the second round of effort, participants in treatments three and four again receive relative performance feedback and are then given the opportunity to reduce the earnings of their fellow group members anonymously. To execute money-burning decisions, we randomly sample one of the four group members' scenarios per subgroup and deduct any 'burning' from second-round earnings.

Last, per treatment, we randomly sample one of the two rounds for pay-out to avoid that effort of the first round will influence effort of the second round (i.e. participants put in less effort because they have already gained significant earnings and reached an implicit income target or vice versa). This announcement is made before the start of the first round of effort.

4.3.2. Hypotheses

This section presents three hypotheses. First, we discuss whether relative performance motivates subjects in the absence of money-burning. After that, we elaborate on whether subjects adjust their effort out of fear of punishment from fellow participants when provided with a money-burning opportunity. Last, we consider how the effect of

money-burning on effort is moderated by relative performance feedback, and whether competitive envy prevails or the anticipated threat of destructive envy.

The following hypothesis is tested to investigate the effect of competitive envy on effort levels:

> *H1. In the absence of a money-burning opportunity, individuals increase their effort levels when socially comparing themselves.*

The provision of relative performance feedback in a second treatment (the first treatment serves as control) enables upward and downward social comparison, which allows subjects to see how they perform relative to the three other group members. Therefore, worse-performing individuals will exert behind-averse behaviour, increasing their effort in a second round to keep up with fellow group members, while better-performing participants will increase their earnings as a result of ahead-seeking behaviour, concerned that fellow participants may outperform them and drop in rank in a subsequent round of effort provision.

The third treatment aims to capture anticipated destructive envious behaviour, leading to a second hypothesis:

> *H2. In the presence of a money-burning opportunity, individuals fear repercussions from less-successful fellow participants when performing well and lower their effort.*

Announcing the existence of an opportunity to reduce the earnings of fellow group members in a third treatment may prompt better-performing individuals to reconsider their effort in a second round, anticipating that worse-performing individuals may target especially better-performing participants to reduce inequality between them. This a priori punishment-evasive behaviour will lower effort compared to a situation where a money-burning opportunity is absent.

In a fourth treatment, both the provision of relative performance feedback and a money-burning opportunity are included, leading to a third hypothesis:

H3. When relative performance feedback and the announcement of money-burning are combined in one treatment, the effect of the threat of destructive envy is stimulated by the provision of relative performance feedback.

When relative performance feedback is provided, participants have a better understanding of what information is disclosed to fellow group members and on which parameters they will be ranked. Moreover, relative performance feedback gives participants an impression of whether they would be highly ranked in a second round or not, and whether they may become a target for envious less performing group members after the second round of effort. As a consequence, they take more account of the threat of money-burning than participants who do not receive relative performance feedback and have no understanding of how they perform relative to others. Therefore, relative performance feedback increases the effect of anticipated destructive envy, and well-performing individuals in a fourth treatment may lower their effort more than participants in the third treatment.

4.3.3. Implementation and sampling

We use a fixed show-up fee of 2,000 UGX (Ugandan shillings), and a variable reward of 500 UGX for every correct answer.[25] Per round, 25 tables can be solved, potentially resulting in a total amount of 12,500 UGX, excluding the show-up fee. This is almost double the amount an average Ugandan household in the eastern region spends on daily consumption.[26] To discourage gambling (i.e. guessing of answers), a penalty of 100 UGX (representing 20% of the earnings for a correct answer) for each incorrect answer is imposed, but earnings could never go below 0 UGX and penalties were not deducted from the show-up fee. Calculators were not allowed, but pen and paper were provided. Two enumerators organised each session. Before the experiment started, enumerators were randomly allocated to sessions to avoid experimenter bias. After the instructions, but before the start of each round, each participant was given a sheet with

[25] Based on the exchange rate during the fieldwork period in July-August 2016, 1 USD = 3,600 UGX.

[26] Information retrieved from the statistical abstract of the Uganda Bureau of Statistics (2017, p. 37).

three treatment specific control questions (multiple choice) to test whether they had understood the instructions sufficiently. After the participants filled out the control questions, the enumerators gave a standard summary of the most critical aspects of the treatment to increase understanding, regardless of the answers to the control questions. The first round was similar for each treatment, so the summary given at the beginning of the first round was also similar. The second round was different for each treatment, and the summaries given at the beginning of the second round were treatment specific.

Our sample includes students from Mbale district (urban) and Sironko district (rural). Focusing on students avoids illiteracy and cognitive ability issues that could have affected the understanding of the experiment. A minimum class size of 30 students was set as a precondition for the inclusion of classes in the sampling frame, ensuring sufficient participants when invited students did not show up for the experiment. Classes were randomly sampled from an exhaustive list of schools and classes in Mbale and Sironko, provided by the Ugandan municipality offices. This led to a sample of five classes in Mbale dispersed over five different schools, and five classes in Sironko dispersed over three different schools.[27] To avoid cross-contamination (i.e. students from one class telling students from another class in the same school about the experiment), classes belonging to the same school participated in the same experimental session. In total, eight experimental sessions were conducted in the period July – August 2016. Sessions took place at the school location on a Saturday morning between 10.00 and 12.00, avoiding interference with school activities.

At the class level, we randomly sampled 50% of the students per class to participate in the effort experiment. A week before the experimental session, participants were asked to fill out a questionnaire at the school location, eliciting their socioeconomic characteristics, and after completion, students received an invitation to take part in the experiment. Information on the experiment was kept brief, and students were only informed they could earn money by completing exercises. In total we invited 332 students, and eventually, 276 of them participated in the experiment. In the Mbale

[27] In the Sironko district, we initially sampled a second class of an already included school. However, the data on the students in this class are not included as only 12 students showed up for the experiment and we did not have enough students to cover all four treatments. Students from this class are also not included in the comparison of non-participants with participants in Table 14.

district, 186 students were invited, and 164 students participated, resulting in a participation rate of 88%. In the Sironko district, 146 students were invited, and 112 students participated, which led to a participation rate of 77%. Overall, the participation rate was 83%.

In each session, each of the four treatments required a minimum of one subgroup of four students, which meant a minimum of 16 students per class was needed to run the experiment successfully. For reasons of comprehension, we allowed a maximum of four subgroups per treatment, implying a maximum of 16 subgroups and 64 students could participate in the experiment simultaneously. Students were randomly sampled into subgroups and treatments, and sampling took place in a classroom. First, students were randomly allocated into subgroups of four participants, after which subgroups were randomly allocated into treatments. Per session, multiple subgroups could be sampled into a similar treatment. To avoid cross-contamination between treatments, each treatment was assigned a classroom where participants received treatment specific instructions. The full sampling of schools and classes into treatments is provided in Appendix C.2.

4.4. Results

4.4.1. Socioeconomic characteristics by participation

To examine if our study is suffering from non-response bias, we compare the socioeconomic demographics of students who were invited but did not participate with the participating students' socioeconomic demographics. The descriptive statistics are presented in Table 14.

Table 14 reveals three significant discrepancies between the two groups. A larger proportion of non-participants identify as Bagisu, a larger proportion of them are firstborn children, and the household dependency ratio is also higher in the group of non-participants than in the group of participants. The latter implies that non-participating students come from households where the average number of children per adult is higher than for participating students. The differences are probably partly the result of a higher non-response in rural Sironko than in urban Mbale. However, using a two-sided t-test we also observe that the household dependency ratio is statistically significantly higher ($p = 0.000$) for firstborn students (1.48) than it is for

non-firstborn students (1.02). Therefore, as experiments were conducted on Saturday mornings to avoid any interference with school-related activities, a possible explanation for students not showing up for the experiment could be that members of the family or household placed stronger obligations on them outside school time. As a result, they could have been more likely to be asked to contribute to the household by providing labour, care for family members (e.g. younger siblings), or financial assistance.[28]

Table 14. Descriptive statistics; non-participants vs. participants

	Non participating students	Participating students	Mean difference
Female	35.7%	41.3%	5.6%
Household wealth index (PCA)	0.04	-0.09	-0.13
Bagisu tribe	85.7%	67.8%	18.0***
Number of siblings	5.9	6.1	0.2
Firstborn	33.9%	19.6%	14.4**
Household dependency ratio [a]	1.36	1.07	0.28**
Father higher education	42.9%	50.4%	7.5
Mother higher education	37.5%	40.2%	2.7
Observations	56	276	332

Notes. * p<0.10, ** p<0.05, *** p<.01. To test for statistical differences, we use a chi-square test for binary variables. For continuous variables we use a two-sided t-test. [a] The household dependency ratio is calculated as the number of household members under the age of 18 years divided by the number of household members over the age of 18 years.

[28] We run a logistic regression with class-level fixed effects (random sampling took place at class-level) and bootstrapped standard errors at the class-level to explore which socioeconomic characteristics in Table 14 determine participation among invited students. We observe that Gisu tribe and firstborn are significant predictors, supporting our findings in Table 14. For robustness reasons we also run a linear probability model with class-level fixed effects and bootstrapped standard errors clustered at the class-level. The results are qualitatively similar and reveal that a Gisu student is 15 percentage points less likely to participate in the experiment, while being a firstborn reduces the probability of participation with 16 percentage points. Appendix C.3 presents the results.

4.4.2. Socioeconomic characteristics by treatment

We use the complete data of 256 high school students in this study.[29] To test for socioeconomic differences across treatments we use a two-sided ANOVA or chi^2 test. Students are allocated to treatments randomly, so differences across treatments would be due to chance. Panel A in Table 15 shows that we cannot reject the null hypothesis that the socioeconomic characteristics are balanced across treatments.

However, the descriptive statistics in panel B of Table 15 show that the effort invested in round 1 is not balanced across treatments. Using pairwise comparisons, we find that on average the participants in the control treatment (T1) have provided significantly more correct answers than participants in the fourth treatment who were exposed to performance feedback and money-burning in the second round (two-sided *p*-value of a t-test < 0.05). We also observe that participants in T1 have significantly lesser incorrect answers than participants who experienced money-burning in the third treatment (two-sided *p*-value of a t-test < 0.05). The pairwise differences among the non-control treatments are also statistically significant for the number of incorrect answers in round 1. The two-sided *p*-values of a t-test are 0.001 when comparing T2 (feedback) with T3 (money-burning) and 0.005 when comparing T2 (feedback) with T4 (feedback and money-burning). In addition, we find that participants in T1 (control) and in T2 (feedback) earned significantly more in round 1 than participants in T4 (feedback and money-burning). The t-test results of both pairwise comparisons have a two-sided *p*-value smaller than 0.05. In the analyses, we will deal with these imbalances when estimating the treatment effects using individual fixed effects regressions.

[29] As guessing answers does not represent effort, we have trimmed the mean on the 95th percentile of the largest range of consecutive errors in round 1 and round 2. Moreover, students belonging to this top five percentile also need to have attempted to answer at least ten tables to be excluded. Overall, 20 'gambling' students were deleted, equally balanced over the treatments with no statistically significant differences between them. Appendix C.4 provides a scatterplot on the largest range of consecutive errors in both rounds, together with distribution plots of the effort variables for the 20 excluded students and the 256 included students.

Table 15. Descriptive statistics of participants

	Treatment 1	Treatment 2	Treatment 3	Treatment 4	P-value
Performance feedback	No	Yes	No	Yes	
Money-burning	No	No	Yes	Yes	
Panel A. Socioeconomic characteristics					
Female	33%	46%	48%	36%	0.225
Household wealth index (PCA)	-0.15	-0.32	0.07	0.11	0.743
Bagisu tribe	77%	64%	66%	61%	0.225
Number of siblings	6.75	5.75	5.87	5.86	0.304
Firstborn	22%	16%	24%	19%	0.723
Household dependency ratio	0.97	1.03	1.20	1.10	0.472
Father higher education	48%	52%	50%	53%	0.926
Mother higher education	43%	48%	34%	39%	0.448
Panel B. Round 1 statistics					
Round 1 total answers solved	13.23	12.67	13.60	12.70	0.195
Round 1 correct answers	10.45	10.30	9.68	9.13	0.074
Round 1 incorrect answers	2.78	2.38	3.92	3.58	0.002
Round 1 earnings (UGX)	4946.38	4909.84	4446.77	4204.69	0.043
Number of subgroups	18	17	17	17	69
Number of participants	69	61	62	64	256

Notes. For continuous variables, the p-value is based on a two-sided ANOVA test, whereas for categorical variables the p-value is based on a chi-square test. 20 Students who 'sabotaged' the experiment by gambling their answers have been deleted from the sample, resulting in numbers of participants per treatment that are not necessarily a multiple of four. Treatment 1 (control): no relative performance feedback, no money burning; Treatment 2: relative performance feedback, no money burning; Treatment 3: no relative performance feedback, money-burning; Treatment 4: relative performance feedback, money-burning.

4.4.2. Descriptive statistics of the change in effort variables

In the remainder of this paper, we use five variables to measure effort. First, we use the number of tables attempted to solve, which primarily reflects the effort to work fast. The second variable we use to measure effort is the number of correct answers. It reflects both the effort to work fast and the effort to work accurately. Third, we look at earnings. We take the earnings before money-burning decisions have been taken and before any money-burning has taken place. Earnings are, therefore, not corrected for any potential money-burning, nor for the cost of money-burning. Earnings are

compiled of a 500 UGX reward for each correct answer minus a 100 UGX penalty for each incorrect answer. The more tables a participant solved correctly, the higher the earnings would be at the end of the experiment. The earnings variable reflects the effort to work fast, the effort to work accurately, and the effort to find the optimal balance between the two as mistakes lead to a reduction in earnings. Fourth, we include the number of incorrect answers. Although it does not reflect effort in the same way as the three other effort variables do, it helps to interpret the quality of effort and the possible effects of the treatments on the effort variables. Fifth, we add to the four effort variables the final earnings after money-burning. This variable does not capture the quantity or quality of effort but helps to assess what treatment is the most efficient and generates the highest welfare, including all costs.

Each of the four effort variables is potentially confounded by ability. Therefore, we concentrate on the change between rounds, assuming that ability has an equal influence on effort levels in round 1 and round 2. Naturally, we realise that learning ability can influence performance in the second round and the change in effort, as some students may learn faster than others. However, the between-subject design allows us to allocate students into subgroups and treatments randomly, and students that learn faster should be equally divided over the subgroups and the treatments. Moreover, as all participants are Senior six students in their final year of high school, we expect the differences in learning ability to be relatively small.

Per treatment, the descriptive statistics of the change in effort between round 1 and round 2 are presented in Table 16. Participants in the control treatment (T1) where both rounds are similar increase the number of correct tables and earnings the least between both rounds. This may be plausible, as the first treatment functions as control and participants are not exposed to relative performance feedback and money-burning in the second round, and a learning effect may account for any change in effort between rounds. Individuals that are exposed to money-burning but not relative performance feedback in a third treatment increase their earnings and the number of tables correctly solved the most in round 2 compared to round 1. What further stands out is the lowest increase in the number of tables participants solve in the fourth treatment where relative performance feedback and money-burning are combined in the second round. Looking at the earnings after money-burning in the last column of Table 16 we see that the average change in earnings presented in the fourth column is reduced substantially with 39% in the third treatment and 44% in the fourth treatment.

Appendix C.5 provides histograms per treatment and effort variable to get a better impression of their distributions. These histograms, however, do not show large and noticeable differences between treatments.

Table 16. Descriptive statistics per treatment

	Change in tables attempted	Change in correct answers	Change in incorrect answers	Change in earnings	Change in earnings after money-burning
	(1)	(2)	(3)	(4)	(5)
	Mean	Mean	Mean	Mean	Mean
T1: Round 2 = Round 1 (control)	2.38	0.54	1.84	84.06	84.06
	(2.99)	(2.76)	(3.62)	(1618.34)	(1618.34)
T2: Feedback	2.49	1.38	1.11	577.05	577.05
	(1.67)	(2.37)	(2.62)	(1401.59)	(1401.59)
T3: Money-burning	2.32	1.53	0.79	687.10	417.58
	(2.35)	(2.90)	(3.37)	(1709.14)	(1606.45)
T4: Feedback and money-burning	1.52	1.22	0.30	579.69	326.56
	(2.31)	(2.63)	(2.78)	(1506.20)	(1578.05)

Notes. Standard deviation in parentheses. The change in effort represents the difference between effort invested in round 2 and effort invested in round 1. Earnings are in UGX.

To examine whether the changes in effort between both rounds are statistically significantly different across the four treatments we use a two-sample t-test. Table 17 displays the mean differences of all possible pairwise treatment comparisons per effort variable and a two-sided *p*-value of a two-sample t-test. The t-test results are not adjusted for testing multiple comparisons, and for that reason, we only discuss differences at the 5% or 1% level.[30] We first compare the control treatment (T1) with the three other treatments in Panel A and find three statistically significant differences. First, the results in the second column reveal that participants in the third treatment (money-burning) increase the number of tables they solved correctly more than the first treatment (control). Second, they also increase their earnings more than participants in the first treatment (control), as can be seen in the fourth column of Table 17. These two results provide initial, contrasting evidence to our second hypothesis

[30] Multiple comparisons increase the likelihood of a type-I error.

that states that the threat of money-burning would decrease effort levels. In addition, the third row of the third column in Table 17 shows that participants in the fourth treatment (feedback and money-burning) increase the number of incorrect answers they submit less than the participants in the control treatment (T1). We do not find any differences between the second treatment (feedback) and the control treatment.

Table 17. Two-sample t-test effort variables

	Change in tables attempted	Change in correct answers	Change in incorrect answers	Change in earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Treatment 2 – Treatment 1	0.11	0.84	-0.73	492.99*	492.99*
	(0.43)	(0.45)	(0.56)	(267.24)	(267.24)
Treatment 3 – Treatment 1	-0.05	1.00**	-1.05*	603.04**	333.5227
	(0.47)	(0.49)	(0.61)	(290.82)	(282.21)
Treatment 4 – Treatment 1	-0.86*	0.68	-1.54***	495.63*	242.5045
	(0.47)	(0.47)	(0.56)	(271.67)	(277.51)
Panel B.					
Treatment 2 – Treatment 3	0.17	-0.16	0.32	-110.05	159.4685
	(0.37)	(0.48)	(0.54)	(282.09)	(272.02)
Treatment 2 – Treatment 4	0.98***	0.16	0.82*	-2.64	250.4867
	(0.36)	(0.45)	(0.48)	(260.56)	(267.44)
Treatment 3 – Treatment 4	0.81*	0.31	0.49	107.41	91.02
	(0.41)	(0.49)	(0.55)	(286.76)	(283.70)

Notes. * p<0.10, ** p<0.05, *** p<.01. Two-sample t-test. Mean differences reported. Standard error in parentheses. The change in effort represents the difference between effort invested in round 2 and effort invested in round 1. Earnings are in UGX. Treatment 1 (control): no relative performance feedback, no money burning; Treatment 2: relative performance feedback, no money burning; Treatment 3: no relative performance feedback, money-burning; Treatment 4: relative performance feedback, money-burning.

Comparing the remaining treatments in Panel B only brings forward one statistically significant difference. The first column of Table 17 shows that participants in the second treatment (feedback) increase the number of tables they solve more than participants in the fourth treatment (feedback and money-burning). All other pairwise comparisons do not differ on any of the effort variables. We find no differences

between the second treatment (feedback) and the third treatment (money-burning), and between the third and fourth treatment (feedback and money-burning). We summarise this finding in a first result.

Result 1. *The t-test results show that money-burning increases the number of correctly solved tables and the final earnings more than the control treatment. Combining money-burning with relative feedback reduces the increase in the number of incorrect answers, compared to the control treatment; and increases the number of tables solved more than the provision of feedback in a second treatment.*

4.4.3. Regression results

In the following section we will run a regression to correct for effort imbalances in the first round and to correct the standard errors for non-independence. As the effort invested in round 1 is not balanced between treatments, we use an individual fixed effects regression to test the robustness of the two-sample t-test results of Table 17. We use the treatment variable as the main explanatory variable:

$$Y_{ir} = \alpha + \beta_1 T1_i * R_{ir} + \beta_2 T2_i * R_{ir} + \beta_3 T3_i * R_{ir} + \beta_4 T4_i * R_{ir} + \mu_i + \varepsilon_{ir} \quad (1)$$

Here, Y_{ir} is the effort of individual i in round r as measured by the number of tables attempted, number of correct answers, number of incorrect answers, or earnings before and after money-burning. The coefficients corresponding to the interaction terms $T1_i * R_{ir}$, $T2_i * R_{ir}$, $T3_i * R_{ir}$, and $T4_i * R_{ir}$ capture the expected change in effort between round 1 (with R_{ir} = 0) as the base category and round 2 (with R_{ir} = 1), for each treatment separately. We make use of individual fixed effects and add μ_i to our model. ε_{ir} is the error term. Experimental sessions took place at school level, and as classes belonging to the same school participated in the same experimental session, we bootstrap cluster the standard error at the school level to adjust for non-independence within experimental sessions.[31] Table 18 shows the estimates of β_1, β_2, β_3, and β_4 for each effort variable.

[31] Bootstrapping is required as we have eight clusters (schools), which is not enough to cluster the S.E. at the school level.

We discuss the results of the regression models in Table 18 per treatment and compare the estimates of that treatment with the estimates of the control treatment. First, we discuss the change in the effort variables for the control treatment (T1), where the conditions in both rounds were the same. Column (1) shows that participants in the first treatment statistically significantly increase the number of tables they attempt to solve in round 2 compared to round 1. The estimate in Colum (2) for the number of correctly solved tables does not indicate a significant change, but the estimate for the number of incorrect answers does. Column (3) reveals that participants in the control treatment give more incorrect answers in the second round than in the first round. Last, the estimate in column (4) shows that participants earned 84.058 UGX more in round 2 than in round 1, but this difference in earnings is not statistically significant. No money-burning took place in the control treatment, which explains why the change in earnings before and after is the same.

We now move to the regression results of the remaining treatments. The second row of Table 18 presents the regression results of the second treatment where participants received relative performance feedback at the beginning of the second round. The participants in this treatment statistically significantly increase their performance on all of the effort variables in the second round, compared to the first round.

To discuss the results of the third treatment where participants were exposed to the threat of money-burning, we examine the estimates in the third row of Table 18. Column (1) reveals that after the money-burning announcement, participants still increase the number of tables they attempted to solve. They also increase the number of tables correctly solved as shown in column (2), but column (3) does not reveal a significant increase in the number of incorrectly solved tables in a second round. As a result of more correctly solved tables, participants in T3 significantly increase their earnings in a second round (fourth column). When deducting the money-burning scenarios per subgroup, the round 2 earnings are not statistically significantly different anymore from the round 1 earnings (fifth column).

Table 18. Average treatment effects

	Tables attempted	Correct answers	Incorrect answers	Earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)
Treatment 1: round 2 = round 1	2.377***	0.536	1.841***	84.058	84.058
	(0.392)	(0.402)	(0.413)	(225.715)	(225.715)
Treatment 2: feedback	2.492***	1.377***	1.115***	577.049***	577.049***
	(0.184)	(0.270)	(0.142)	(145.967)	(145.967)
Treatment 3: money-burning	2.323***	1.532***	0.790	687.097**	417.581
	(0.343)	(0.479)	(0.573)	(287.334)	(268.219)
Treatment 4: money-burning & feedback	1.516***	1.219**	0.297	579.688*	326.563
	(0.255)	(0.554)	(0.424)	(315.824)	(261.127)
Constant	13.055***	9.895***	3.160***	4631.250***	4631.250***
	(0.211)	(0.183)	(0.144)	(95.521)	(95.521)
R^2 within	0.459	0.166	0.118	0.097	0.052
Observations	512	512	512	512	512

Notes. * p<0.10, ** p<0.05, *** p<.01. Individual fixed effects regression. Bootstrapped standard errors clustered at the school level and in parentheses. Round 1 is the base category for each treatment, and the coefficients represent the change in effort between round 2 and round 1. Earnings are in UGX.

For the fourth treatment (relative performance feedback and money-burning), the result in the first column shows that participants significantly increase the number of tables they attempted to solve. They also significantly increase the number of correct tables (second column), but column (3) reveals they do not change the number of incorrectly solved tables between both rounds. Column (4) shows that participants in the fourth treatment increase their earnings in the second round but that increase is only marginally significant. After deducting the money-burning scenarios, column (5) demonstrates that the earnings of round 2 are not statistically different from the earnings in round 1 anymore.

To find out whether the changes in effort between the first and second round are statistically significantly different across the treatments, we use a Wald Chi-Square test and present the test results in Table 19. We only discuss significant differences and start with Panel A. The first row provides the results of comparing the effect of relative feedback in a second treatment with the control treatment. The significant Wald Chi-Square test statistic in column (2) reveals that participants in a second treatment (feedback) increase the number of correct answers between round 1 and round 2 more than participants in the control treatment. This implies that the provision of relative performance feedback in a second treatment results in more dedicated behaviour to solve as many tables correctly as possible. This finding is supported by the Chi-Square test statistic in column (3), which reveals that the second treatment increases the number of incorrect answers less than the control treatment. However, this difference is only marginally significant. Having a large increase in the number of correct answers while making fewer mistakes than the control group has an effect on earnings. The Wald Chi-Square test statistic in column (4) shows that participants in the second treatment (feedback) increase their earnings statistically significantly more than the control treatment. Altogether, these significant differences in the change in correct answers, incorrect answers, and earnings between the second treatment and the control treatment confirm our first hypothesis that the provision of relative performance feedback generates competitive envy, which increases the effort to work faster and more dedicatedly.

The second row of Panel A in Table 19 presents the effects of money-burning in a third treatment. The Wald Chi-Square test statistics in this row of Table 19 are all insignificant. The absence of statistically significant differences in effort between the

third treatment and the control treatment rejects our second hypothesis that participants anticipate on destructive envy of fellow participants and decrease their effort.

The third row of Panel A in Table 19 presents the differences between the control treatment and the fourth treatment, where money-burning is combined with relative performance feedback. In combination with the results from Table 18, the Wald Chi-Square test result in column (1) reveals that participants in the fourth treatment increase the number of tables they attempt to solve statistically significantly less than participants in the control group. The Wald Chi-Square test statistic in column (3) also provides evidence that the increase in the number of incorrect answers of the fourth treatment is smaller than the increase of the control treatment.

Table 19. Pairwise comparisons average treatment effects

	Tables attempted	Correct answers	Incorrect answers	Earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)
Panel A.					
Treatment 2 – Treatment 1	0.07	5.64**	2.93*	6.69***	6.69***
Treatment 3 – Treatment 1	0.01	2.01	1.47	2.21	0.89
Treatment 4 – Treatment 1	5.64**	0.75	4.31**	1.18	0.37
Panel B.					
Treatment 2 – Treatment 3	0.41	0.07	0.29	0.11	0.34
Treatment 2 – Treatment 4	6.80***	0.07	3.52*	0.00	0.76
Treatment 3 – Treatment 4	4.03**	1.24	0.94	0.37	0.30

Notes. * p<0.10, ** p<0.05, *** p<.01. Wald chi^2 test, Chi^2 (1) reported. The pairwise comparisons test whether the change in effort (round 2 – round 1) is statistically different across treatments. Treatment 1 (control): no relative performance feedback, no money burning; Treatment 2: relative performance feedback, no money burning; Treatment 3: no relative performance feedback, money-burning; Treatment 4: relative performance feedback, money-burning.

In addition, we compare the fourth treatment with the two other treatments in Panel B of Table 19 and find that the fourth treatment (feedback and money-burning) differs from the second (feedback) and the third treatment (money-burning) mainly in the increase of total tables attempted. The Wald Chi-Square test result column (1) shows that the increase in the number of tables solved in the fourth treatment is smaller than the increase in the second treatment where money-burning was not included.

Comparing the fourth treatment with the third treatment where feedback on first-round performance was not provided, we also find that the increase in the number of tables solved in the fourth treatment is smaller than the increase in the third treatment. Altogether, even though the participants in the fourth treatment increase their effort in a second round significantly, the results indicate that they lower their effort to work fast and accurately not only in comparison to the participants in the control treatment but also to the participants in the other two treatments. These findings confirm our third hypothesis that individuals lower their effort when threatened with destructive envy from fellow participants in a situation where feedback is provided on relative performance in a previous round. A reduction in effort is then mainly reflected in the effort to work fast. We summarise these findings in a second result.

Result 2. *The individual fixed effects regression results show that relative feedback increases the number of correct tables solved and the final earnings more compared to the control treatment. Combining money-burning with relative feedback reduces the increase in the number of tables solved and the number of incorrect answers, compared to the control treatment; and reduces the number of tables solved compared to the money-burning treatment without feedback.*

4.4.4. Heterogeneous treatment effects

To provide further evidence that envy drives the treatment effects, we compare the results of the poorest and wealthiest participants.[32] We expect to find differences driven by one of two alternative hypotheses. First, we expect students to bring existing social relations into the experiment. Students know each other, and therefore know who is from a wealthier background. As a result, the wealthier participants may anticipate that their wealthier background makes them more likely to be targeted in

[32] Although we used a stratified sample based on a rural/urban dimension, we find only one statistically significant difference between the treatment effects in the Sironko and Mbale subsamples in the effort variables. In the number of tables attempted to solve Mbale participants are affected more by to the threat of money-burning (third treatment) than Sironko participants. This effect may be caused by the fact that Mbale participants are wealthier than Sironko participants (two-sided p-value in a t-test is < 0.1).

situations of money-burning. Especially when performing well, their wealth may justify money-burning decisions. In contrast, poorer students are less worried about the role of their wealth in money-burning decisions of fellow group members, and their effort will be less affected by the threat of money-burning. Alternatively, we expect the relative value of money that can be earned during the experiment to decrease when wealth levels increase, which reduces the importance of positional concerns. The wealthiest students are then less motivated by relative performance feedback, but also less discouraged by the threat of money-burning, while for the poorest students the treatments will have the opposite effect.

The wealth index is compiled using a method proposed by Filmer and Pritchett (2001).[33] They base their index on household assets and not on consumption or income, which is often difficult to measure in a developing country context. As the effect of household wealth may be non-linear, we do not use the entire index, but compute five wealth quintiles and use subsamples for the poorest quintile and the wealthiest quintile. As they represent the most extreme values on both sides of the wealth index, we expect to find the largest differences. We use equation (1) for both subsamples and use Wald Chi-Square tests per subsample to explore statistically significant differences between the control treatment and the three other treatments.

Table 20 presents the treatment effects per wealth quintile. The first five columns show the treatment effects for the poorest students, while the last five columns present the treatment effects for the wealthiest students. We first discuss the treatment effects in the poorest wealth quantile. The results in the first column show that all four treatments significantly increase the number of tables attempted to solve in round 2 compared to round 1. Apart from a marginally significant positive effect in the second treatment, column (2) does not reveal statistically significant increases in the number of correctly solved tables in any of the remaining treatments. In the third column, however, we find that only the second treatment significantly increases the number of incorrectly solved answers in round 2. Also, no evidence is found that proves that the poorest participants significantly increased their earnings in the second round in any of the four treatments. When looking at earnings after money-burning, we find that

[33] To calculate the wealth quintiles, we weigh the household wealth index on the total number of household members. Without these weights, large but poor families would still score high on the wealth index because of pooled assets.

money-burning combined with feedback in a fourth treatment has a marginally significant negative effect on round 2 earnings compared to round 1. Altogether, these results suggest that providing relative performance feedback in a second treatment affects the round 2 effort of the poorest participants the most. The large increase in incorrect answers in T2, however, results in higher penalties as 100 UGX is deducted from the earnings in that particular round for each incorrect answer, eliminating a positive effect of working faster on the earnings of the poorest participants.

We now look at the last five columns of Table 20, which present the average treatment effects for the wealthiest subsample. Column (6) demonstrates that all four treatments statistically significantly increase the number of tables attempted to solve in the second round. In addition, only the control treatment (T1) significantly increases the number of correct answers in round 2, as shown in column (7). The second treatment also increases the number of correct answers, but the effect is only marginally significant. Moving to the number of incorrect answers in column (8), the results reveal that only the third treatment with money-burning increases the number of incorrectly solved tables in round 2. Last, we examine the earnings, and column (9) presents evidence that participants in the control treatment (T1) significantly increase their earnings in the second round. The results also indicate that participants in the third treatment with money-burning decrease their earnings in round 2, but this effect is only marginally significant. The post-money-burning treatment effects on earnings presented in column (10) are similar to those in column (9). In sum, the results suggest that exposure to money-burning without relative performance feedback in a third treatment affects the effort of the wealthiest participants the most.

Table 20. Average treatment effects: poorest and wealthiest subsample

	Wealth index 1st quintile subsample (poorest students)					Wealth index 5th quintile (wealthiest students)				
	Attempted	Correct	Incorrect	Earnings	Earnings after money-burning	Attempted	Correct	Incorrect	Earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
T1: round 2=round 1	1.615***	0.308	1.308*	23.077	23.077	1.583***	1.167***	0.417	541.667***	541.667***
	(0.610)	(1.010)	(0.753)	(566.779)	(566.779)	(0.512)	(0.281)	(0.650)	(189.719)	(189.719)
T2: feedback	3.429***	1.071*	2.357***	300.000	300.000	2.500***	1.667*	0.833	750.000	750.000
	(0.501)	(0.571)	(0.881)	(362.995)	(362.995)	(0.414)	(0.853)	(0.677)	(491.209)	(491.209)
T3: money-burning	1.692***	0.846	0.846	338.462	330.000	2.600***	-0.400	3.000***	-500.000*	-610.000*
	(0.521)	(0.681)	(1.000)	(430.877)	(434.378)	(0.878)	(0.491)	(0.801)	(268.172)	(328.336)
T4: money-burning &	1.333**	0.222	1.111	0.000	-577.778*	1.000***	0.077	0.923	-53.846	-361.538
feedback	(0.675)	(0.716)	(0.810)	(412.852)	(325.172)	(0.383)	(0.506)	(0.728)	(326.583)	(342.352)
Constant	13.367***	10.388***	2.980***	4895.918***	4895.918***	12.617***	9.404***	3.213***	4380.851***	4380.851***
	(0.387)	(0.540)	(0.239)	(288.693)	(288.693)	(0.307)	(0.370)	(0.323)	(208.021)	(208.021)
R^2 within	0.569	0.028	0.163	-0.022	-0.000	0.522	0.138	0.276	0.100	0.123
Observations	98	98	98	98	98	94	94	94	94	94

Notes. * p<0.10, ** p<0.05, *** p<.01. Individual fixed effects regression. Bootstrapped standard errors clustered at the school level and in parentheses. Round 1 is the base category for each treatment, and the coefficients represent the change in effort between round 2 and round 1. Earnings are in UGX.

Table 21. Pairwise comparisons treatment effects per wealth subsample

	Wealth index 1st quintile subsample (poorest students)					Wealth index 5th quintile (wealthiest students)				
	Tables attempted	Correct answers	Incorrect answers	Earnings	Earnings after money-burning	Tables attempted	Correct answers	Incorrect answers	Earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A.										
Treatment 2 – Treatment 1	5.40**	0.75	1.27	0.28	0.30	2.08	0.35	0.31	0.19	0.20
Treatment 3 – Treatment 1	0.01	0.12	0.09	0.12	0.11	0.66	6.56**	3.98**	8.21***	7.50***
Treatment 4 – Treatment 1	0.29	0.01	0.03	0.00	1.28	0.89	3.24*	0.31	2.38	5.59**
Panel B.										
Treatment 2 – Treatment 3	5.40**	0.05	1.12	0.00	0.00	0.01	4.75**	2.69	4.66**	5.22**
Treatment 2 – Treatment 4	7.40***	1.73	1.23	0.57	6.13**	14.99***	1.73	0.01	1.21	2.65
Treatment 3 – Treatment 4	0.17	0.40	0.05	0.33	2.24	2.31	0.52	3.37*	1.28	0.28

Notes. * p<0.10, ** p<0.05, *** p<.01. Wald chi^2 test. Chi^2 (1) reported. The pairwise comparisons test whether the change in effort (round 2 – round 1) is statistically different across treatments. Treatment 1 (control): no relative performance feedback, no money burning; Treatment 2: relative performance feedback, no money burning; Treatment 3: no relative performance feedback, money-burning; Treatment 4: relative performance feedback, money-burning.

To study whether the changes in effort are significant different across treatments we need to conduct Wald Chi-Square tests for each of the two wealth groups. Table 21 presents the test statistics. We first discuss the results of Panel A for the poorest subsample. The Wald Chi-Square test statistic in column (1) implies that the poorest participants that received feedback (T2) increase the number of tables solved significantly more than the poorest participants in the control treatment (T1). No other differences are found between the three treatments and the control treatment. However, when comparing the second, third and fourth treatment in Panel B we find additional differences across the treatments. The first two Chi-Square test statistics in column (1) reveal that the increase in the number of tables attempted is larger for the poorest participants in the second treatment (feedback) than for the poorest participants in the third (money-burning) and fourth treatment (feedback and money-burning). Altogether, these findings reveal that performance feedback (T2) motivates the poorest students to work fast, mainly because they increase the number of incorrect answers, revealing a low quality of effort. They are, however, not susceptible to the threat of money-burning (T3), also not in combination with feedback (T4).

To examine whether the estimates are significantly different between the control treatment and the three other treatments for the wealthiest subsample, we look at the last five columns in Table 21. Starting with Panel A, we compare the change in effort of the third treatment (money-burning) with the control treatment, and the result in column (7) points out that in the third treatment (money-burning), the increase of the number of tables correctly solved is smaller than in the control. The increase in the number of incorrect answers is also larger in the third treatment than in the control (T1), as can be seen in column (8). In addition, column (9) provides evidence that the increase in earnings for participants in the third treatment is statistically significantly smaller than for the participants in the control treatment. The same effect also holds for earnings after money-burning in column (10). Moreover, the change in effort of the fourth treatment (feedback and money-burning) also differs from the change in effort in the control treatment. First, the increase in correct tables is smaller in the fourth treatment than in the control, but the difference is only marginally significant as shown in column (7). Second, the result in column (10) demonstrates that the increase in change in earnings after money-burning is also significantly smaller in the fourth treatment (feedback and money-burning) than in the control treatment.

In sum, the regression results for the wealthiest subsample reveal that the wealthiest students are sensitive to the threat of money-burning in the third treatment. Compared to the control treatment (T1), the threat of money-burning (T3) leads to a lower number of correctly solved tables, an increase in the number of incorrectly solved tables, and a decrease in the earnings in round 2 for the wealthiest participants. Altogether, wealthiest students respond to the threat of money-burning with less dedicated, lower quality effort and lower final earnings. The results also show that money-burning combined with feedback in a fourth treatment is costly for the wealthier students as earnings after money-burning are significantly lower than in the control (T1).

A possible explanation for this result could refer to existing social relations that are brought into the experiment. The experiment is not anonymous and students know who they are grouped with, and as they are class mates they also know their fellow group members' wealth background. Therefore, if a wealthy participant performs relatively well in the second round, other participants may perceive this as unfair or undeserving in combination with the existing wealth distribution brought into the experiment, and could justify their decision to reduce the second-round earnings of that wealthy participant. Wealthy students can therefore anticipate this mechanism and lower their effort in round 2 in order to avoid being targeted during the money-burning process.

To examine whether the effects of the treatments for each wealth subsample are statistically significantly different for the poorest and the wealthiest students we compare their estimates per treatment. For this, we take a subsample that only includes the poorest and wealthiest students, and we interact a dummy variable that represents belonging to the wealthiest quintile (yes = 1, no = 0) with the treatments. The poorest wealth quintile is the base category. Per treatment, the interaction coefficient represents the difference in effort between the poorest and wealthiest subsample and indicates whether the difference is statistically significant. Because of this approach, we do not need a Wald Chi-Square test to compare estimates. The regression results and coefficient plots are attached in Appendix C.6. The results show that the wealthiest participants make more mistakes and earn less in the third treatment (money-burning) than the poorest participant in the same treatment, but this difference is only marginally significant. However, both subsamples include only 98 and 94 observations, and this

limited number of observations may hinder finding significant differences between the subsamples.[34]

To increase statistical power, we use the same approach as we did to compare the poorest and wealthiest subsamples (wealth dummy * treatment), but now we compare the effects of each of the two wealth quintiles with the entire pool of remaining students. For the poorest subsample, we use a dummy variable with a value of 1 for the poorest quintile and 0 for all other quintiles and interact it with the treatments, while for the wealthiest quintile we replace that dummy variable with a variable that takes a value of 1 for the wealthiest quintile and 0 for all other quintiles. This means that student who do not belong to the poorest quintile are inherently wealthier than the students in the poorest quintile, and students who do not belong to the wealthiest quintile are inherently poorer than the students in the wealthiest quintile. The results are presented in Appendix C.7.

With this approach, we observe strong interaction effects which are similar to the results from the subsample regressions already presented in Table 20 and Table 21. Looking at the difference in treatment effects between the poorest wealth quintile and the remaining pool of students, the results reveal that providing relative performance feedback to the poorest participants in the second treatment increases the number of tables they try to solve more in round 2 compared to wealthier participants in the same treatment. This confirms our finding that especially the poorest students are sensitive to relative performance feedback (T2) as they work faster than the other students.

When we look at the difference in treatment effects between the wealthiest quintile and the remaining pool of students we observe that exposing the wealthiest participants to the threat of money-burning in the third treatment affects their effort statistically significantly more than the effort of the remaining pool of students in the third treatment: they increase the number of correct tables significantly less, increase the number of incorrect answers significantly more, and increase their earnings significantly less in the second round than the other students in the third treatment. For the fourth treatment (feedback and money-burning), we find that the wealthiest

[34] As we use an individual fixed effects regression, we need to reshape the dataset into long. This results in two observations for each participant (an observation for effort in the first round and an observation for effort in the second round), meaning that the 98 and 94 observations represent 49 and 47 participants, respectively.

subsample is more sensitive to money-burning in combination with feedback than the remaining pool of students, but the difference in treatment effects is only marginally significant. The wealthiest students increase the number of correct tables less than the remaining students, which results in a lower increase in earnings. All in all, these results confirm our finding that wealthier students are more sensitive to money-burning (T3) as it lowers the quality of their effort and their earnings.

In sum, the regression results in this section show that wealth influences the treatment effects. The poorest quintile is more sensitive to relative performance feedback in the first treatment, increasing the number of tables attempted, albeit at low quality (i.e. incorrect answers), whereas the wealthiest quintile is more sensitive to the threat of money-burning in the third and fourth treatment, which lowers their number of correctly solved answers, earnings, and quality of effort (i.e. incorrect answers). We summarise the findings in a third result:

Result 3. *In the poorest subsample, relative feedback increases the number of tables solved more compared to the control treatment, the treatment with money-burning, and the treatment that combines money-burning and feedback. In the wealthiest subsample, money-burning without relative feedback increases the number of tables solved and the final earnings less, and increases the number of incorrect answers more compared to the control treatment. The treatment effects of both subsamples do not differ, but when comparing the treatment effects in the subsamples with the remaining pool of students independently, the results indicate that the poorest students are more sensitive to relative feedback, while the wealthiest students are more sensitive to money-burning.*

4.5. Discussion of results

In this section, we interpret our results and position them in the existing literature on competitive and destructive envy. We first discuss the effect of relative performance feedback on effort. We then elaborate on why the threat of money-burning does not affect effort, but when combined with relative performance feedback it does, and clarify the influence of wealth on both effects. We end with discussing what our results mean for development policy and inequality in small-scale societies.

Our first main result indicates that relative performance enables social comparison which stimulates competitive behaviour among participants in the second treatment. When receiving relative performance feedback, participants increase the number of correctly solved answers, which reflects both the effort to work fast and the effort to work accurately. This translates into increased earnings. Our findings are in line with studies like Azmat and Iriberri (2010), Azmat and Iriberri (2016), Falk and Ichino (2006), Gill et al. (2018), Herbst and Mas (2015), and Mas and Moretti (2009), amongst others, that use lab and field experiments to show the positive effect of social comparison on performance. Overall, the second treatment generates the highest welfare of all treatments.

Moreover, our results reveal that the poorest participants are more sensitive to the provision of relative performance feedback than others. They increase the number of incorrect answers significantly more than wealthier participants in round 2, which explains a significantly large increase in the number of tables attempted. The number of correct answers remains unaffected. As the money that can be earned during the experiment can bear more value for the poorest participants than for the wealthier participants, the provision of relative performance feedback may have caused anxiety amongst the poorest subjects, which in combination with the effort to work fast had an adverse effect on accuracy and quality of work in the second round. Altogether, a high(er) reward can increase pressure which can have an adverse effect on performance and the quality of work.

Our second key result reveals that even though the threat of envious behaviour in itself does not affect effort, when combined with relative performance feedback in the fourth treatment it lowers effort. Informing participants on fellow group members' performance, while subsequently announcing the potential threat of money-burning significantly lowers effort. Our empirical evidence of the anticipated cost of performing well connects to the findings of Bursztyn and Jensen (2015), who demonstrate that high school students take account of the social cost of educational performance, fearing social punishment from classmates when doing well in school. A plausible explanation for the moderating role of relative performance feedback singles out that when informed on relative performance before the start of the second round, participants know better how they would be ranked after the second round of effort. This feedback informs students what it takes to rank as a top performer, which makes that top-performing subjects take more account of money-burning than less

performing subjects. We find no evidence though that relative performance feedback influences actual money-burning behaviour (i.e. no differences in behaviour between the treatment with and the treatment without relative feedback).[35] Perhaps having added a third round of effort would have shed more light on the relationship between information disclosure and anticipated money-burning behaviour. It could have shown, for example, how participants respond once their earnings have been reduced, or how they respond when they find out they have not been targeted.

In addition, the heterogeneous treatment effects demonstrate that household wealth of participants plays a role in participants' anticipation of potential money-burning behaviour. The wealthiest participants react stronger to the threat of money-burning than poorer participants in the third treatment. This result shows that even without the provision of relative performance feedback the wealthiest participants lower their effort after the threat of money-burning (in the third treatment), whereas less wealthy participants do not. It implies that feedback on round 1 performance affects other participants' anticipation of money-burning but bears less relevance for the anticipation of the wealthiest students.

This wealth effect is in line with our hypothesis that states that existing social relations are brought into the experiment. As students in subgroups are classmates with existing social relationships outside the experiment, the wealthiest participants may anticipate on their fellow group members to take account of their wealthy background. In combination with performing well, their wealthy background could fuel and justify the decision of fellow group members to target them and reduce their earnings. This explanation links to empirical evidence that shows that a large proportion of people challenge the fairness of the existing wealth distribution, which affects people's response to growing inequality (i.e. a wealthy participant also being a top performer in the effort experiment could be considered unfair) (Cappelen, Hole, Sørensen, &

[35] In terms of money-burning, the participants in the third treatment decided to reduce the earnings of others in 17% of the decisions (our design allows a participant one money-burning decision per fellow group member, resulting in three decisions per participant) and 4% of the total earnings was reduced (on average 201 UGX per participant and 1176 UGX per participant that was actually targeted). In the fourth treatment, students decided to reduce the earnings of others in 22% of the decisions, and 5% of the earnings were reduced (on average 277 UGX per participants and 1280 UGX per participant targeted). There are no statistically significant differences in money-burning behaviour between participants in the third and the fourth treatment.

Tungodden, 2007; D. Fehr, 2018; Norton & Ariely, 2011). So, the wealthiest participants may anticipate that when doing well in a second round their poorer fellow group members may consider their relatively high earnings unfair in light of the existing wealth distribution in real-life. This would justify targeting them when offered an opportunity to reduce earnings.

In addition, when interpreting all these results on money-burning, we should bear in mind that although the threat of money-burning combined with feedback lowers effort, both money-burning treatments do not have higher costs and do not lead to lower welfare than the control treatment, apart for the wealthiest subsample. Only for the wealthiest students, money-burning in both treatments is costly and results in lower welfare before and after actual money-burning.

As we do not find an effect of relative performance feedback on the effort of the wealthiest students, we can only partly confirm our second, alternative hypothesis that states that the money that can be earned during the experiments holds less value for the wealthiest participants, which are therefore significantly less motivated by relative performance feedback than the poorer participants.

Regrettably, this paper has not been able to investigate whether group composition and the interaction with participants' own characteristics has a moderating effect on the anticipated threat of destructive envy. Such an analysis would allow investigating whether homogeneity in gender, tribe, and wealth, amongst other characteristics, either stimulates competitive envy or destructive envy among like-minded peers, or whether heterogeneity drives competitive and destructive envy, and whether it has an effect on the anticipation of destructive envious behaviour. Also, investigating the role social interactions play would add to our understanding, and would shed more light on why certain communities fare better than others. Angelucci, De Giorgi, Rangel, and Rasul (2009), for example, shows that egalitarian villages with dense social networks are more likely to be poor, while Charness et al. (2013) show that people engage less in destructive behaviour when belonging to the same group, pointing out the importance of group identity.

In terms of development policy, our findings on competitive behaviour are essential for interventions that aim to stimulate productivity by emphasising income inequalities, for example through exposure to successful peers. Studies like Bernard et al. (2014) on Ethiopia and Macours and Vakis (2014) on Nicaragua demonstrate that exposing the poorest in society to successful, similar people can increase the effort

they invest in improving their livelihoods. Inequality can then have a positive effect on the productivity of the poor and stimulates them to catch up with top performing individuals to reduce that inequality, while top performers are stimulated to stay ahead of them.

Such a mechanism, however, only works in the absence of a destructive envy environment. Development policy aimed at empowering the poor need to pay ample attention to cultural and psychological factors that enable destructive envious behaviour, especially in egalitarian societies with high levels of social capital. Grolleau et al. (2006) state that creating visible differences by exposing poor people to successful peers in their communities can have a harmful effect on the success and productivity of these peers, as they themselves may become the target of destructive envy. But even without being the target of destructive behaviour, the anticipation of the threat will already suffice to lower the productivity of successful individuals. Inequality then has a potentially destructive effect on the productivity of individuals, especially of top performers. Under such conditions, strategies that emphasise equality will be more effective in increasing the productivity of the poor in egalitarian societies. To allow equal opportunity, such policies should focus on enabling poor people equal access to capital, land and information while eliminating legal and customary barriers.

4.6. Conclusion

Inequality that is generated by varying levels of effort can render feelings of envy that reduce inequality either by stimulating competition and trying to catch up with the top performing individuals or by destroying their earnings. This study disentangles the effect of competitive and destructive envy on effort and uses a real-effort experiment in Ugandan high schools where students perform a counting task in two consecutive rounds. In addition to a control treatment, the experiment implements three additional treatments: the second treatment provides students feedback on their relative performance, the third treatment includes the threat of a money-burning opportunity, and a fourth treatment combines both elements. We implement an individual fixed effects regression to correct for effort imbalances in round 1 as the effort invested in a first round is not balanced across treatments. The regression results reveal that competitive envy generated by the provision of relative performance feedback in a second treatment increases the effort to work accurately and dedicatedly, which leads

to higher welfare. We also find that the destructive envy, operationalised as the threat of money-burning, is only credible when combined with relative performance feedback on round 1 performance, lowering the effort to work fast.

Analysing the treatment effects further, we find that wealth of the students moderates the effects of relative performance feedback, money-burning and a combination of both. The interaction effects between wealth and treatment reveal that the poorest students are more sensitive to the provision of relative performance feedback than wealthier students, increasing their effort to work fast but at low quality. A plausible explanation for competitive envy causing low quality of effort among the poorest participants could be that the reward for each correct answer represents a relatively higher value for poorer students than for wealthier students, which can generate anxiety that affects performance.

In addition, we observe that the wealthiest students are more sensitive to the threat of destructive envy than the poorer students, lowering their effort to work fast and accurately. For them, not only the threat of money-burning but also actual money-burning is costly and lowers their welfare. A possible explanation refers to the existing wealth distribution among students which is brought into the experiment. Wealthy students who perform well anticipate that they are more likely to be targeted than less wealthy students who do well. As a result, they work less dedicatedly and less accurately and their effort is of lower quality in round 2. Therefore, in contrast to the other students, destructive envy is costly for the wealthiest students and results in lower welfare before and after money-burning is implemented.

In terms of policy recommendations our results suggest that exposure to successful, like-minded individuals can be a successful community-level intervention to encourage competitive envy and increase welfare, although not for the poorest participants. However, such a policy is not effective in the presence of destructive envy, and even has the potential to lower the welfare of the wealthiest individuals.

Chapter 5. Conclusion

5.1. Aspirations and the social environment

Aspirations and poverty are interconnected. Aspirations determine human capital investments, which are important to escape poverty. Crucial in this stands the capacity to aspire, which is the capacity to formulate aspirations in straightforward goals and results, and to shape clear pathways that should lead to their attainment in the existing social, cultural, and economic context. Lacking this capacity to aspire means that people do not always aspire to the most 'advantageous' or 'correct' alternatives, or do not aspire to levels that would fulfil their potential.

Often, the poor lack this navigational capacity to aspire and as a result, have lower or less optimal aspirations than the non-poor. Being poor has a direct effect on psychological cognitive abilities, which in combination with a lack of resources limits the capacity to obtain and process information, experiment with different pathways to successful outcomes, and explore promising opportunities. Eventually, poor people may come to terms with their marginal living conditions and internalise their identity of 'the poor'. As a result, they lower their aspirations or adopt nonoptimal aspirations which manifest their economic hardship.

This thesis followed Appadurai (2004, p. 67), and took as starting point that the capacity to aspire is shaped in 'the thick of social life'. It demonstrates that through gender norms and peer influences like peer effects and envy the social environment shapes the aspirations of young people, which can either manifest or alleviate their poverty. The following sections summarise the results of the three empirical chapters and highlight the contributions they make to the existing literature. Thereafter, their implications for development policy are discussed. This concluding chapter ends with a discussion section on the limitations of the study and provides avenues for future research.

5.2. Main results

This section summarises the main findings on the relationship between the social environment and aspirations of high school students. Each empirical chapter addressed

on of the following three research questions introduced in the first chapter of this thesis:

1. To what extent do boys and girls aspire to economic independence and what is the influence of competing alternative aspirations?
2. How are the aspirations of youngsters affected by the aspirations of their friends?
3. What are the effects of competitive and destructive envy on effort?

5.2.1. Economic independence and competing alternative aspirations; gender differences

Gender differences in aspirations are the product of gender norms, which have the potential to perpetuate gender inequalities among young people. The second chapter of the thesis provides insight into how boys and girls experience competition from six alternative aspirations in the social and educational spheres while trying to obtain their economic independence. The qualitative data obtained through 38 open-ended interviews established that economic independence is a highly valued aspiration that revolved around issues like income, ownership, and wealth. As underlying motivators, respondents described increased levels of maturity and autonomy and being able to take care of others. The open-ended interviews also revealed three distinct categories of aspirations that competed with economic independence. The first category included traditional family aspirations like marriage and fertility, which were motivated by the quest for social status and conformation to dominant social and religious norms. The second category included communal aspirations like peaceful relations with relatives, living in the proximity of family and friends and community engagement. These three aspirations were driven by socioeconomic safety, inclusion in social networks, and access to resources and social capital. The third category contained the aspiration to obtain a higher educational degree, which was considered the main gateway to a better life.

In addition to the open-ended interviews, 572 students self-completed a questionnaire. The results showed that students considered each of these six pairs of aspirations competing, which validated the starting point of this chapter that young people face constant trade-offs between aspirations when trying to better their lives. In the analysis of the questionnaire data collected, the weights given to economic

independence, relative to the competing alternative aspirations, were regressed on gender. Socioeconomic controls were added to the OLS regression with class-level fixed effects as boys and girls enrolled in the most senior year of high school came from inherently different socioeconomic backgrounds. The results revealed that even though boys and girls both aspired more to economic independence than the alternatives (apart from education), girls aspired more to five of the six alternatives than boys. In addition, an individual fixed-effects regression was used to investigate the importance of the relative weights given to the six alternative aspirations. The regression results revealed that students gave the aspiration to obtain higher education most weight, followed by the communal aspirations maintaining peaceful relations with relatives, living near family and friends, and community engagement. Also here, gender differences were found. For girls, education and community engagement were more important alternatives, while boys gave more weight to peaceful relations with relatives and living near family and friends. Altogether, the results of the second chapter present clear evidence that girls aspire less to economic independence and more to its alternatives than boys.

5.2.2. Peer effects in aspirations

The third chapter zooms in on three pairs of aspirations where economic independence is traded off against communal aspirations. The main assumption in this chapter is based on an economic model of conformity also known as the local average model (Patacchini & Zenou, 2012). Individuals gain maximal utility if they conform their aspirations to the average aspiration level of their friends. The closer to that average, the higher the utility, and vice versa. This assumption implies that the aspirations of the individual and the aspirations of the group of which the individual is a member correlate positively and move in the same direction. The simultaneity of aspirations poses a challenge to studying the effect that friends can have on the aspirations of the individual. This complication is also known as the reflection problem.

This chapter added the individual-specific friendship networks of 538 students within 11 classes to the aspirations data of the second chapter, which allowed the use of the non-overlapping peers' approach as suggested by Bramoullé et al. (2009). In this approach, the aspirations of friends were replaced with the exogenous characteristics of friends of friends who were not friends of the individual (hence the

name non-overlapping peers). These characteristics were expected to correlate with the aspirations of friends as endogenous regressor, but not with the aspirations of the individual as dependent variable. To implement the non-overlapping peers' approach, students without friends or non-overlapping peers were deleted from the sample, after which IV/2SLS and IV/GMM twostep methods were used to estimate the peer effects. Only nominated ties were included to uphold the restriction that individual-specific friendship networks partly overlapped. When instrumenting the endogenous regressor with the exogenous variables of non-overlapping peers, the results of both IV estimation methods revealed peer effects in two out of three pairs. The OLS estimates are smaller than the IV/2SLS and IV/GMM estimates, which reveals that the OLS regressions are downward biased. Therefore, we conclude that the exclusion bias in the OLS estimates is stronger than the reflection bias despite having relatively large friends networks.

The instrumental variables regression results reveal that peer effects exist in trading off the aspiration to become economically independent against alternative aspirations in the social sphere. More specifically, when trading off economic independence against living near family and friends, the aspiration levels of the individual are positively influenced by the average aspiration level of friends. The same conclusion holds when trading off economic independence against community engagement. If the average aspiration level of ego's friends increases in favour of one alternative at the expense of the other, ego conforms to the group average of his or her individual-specific network and starts aspiring accordingly. This will keep the distance between ego's aspiration level and the average aspiration level of ego's friends to a minimum. Our findings support the local average model which suggests that not deviating from the social norm avoids incurring costs and maximises utility. Moreover, our results also provide evidence that peer effects not only influence behaviour as suggested in most studies on peer effects but also shape individual attitudes that are not directly observable.

The IV test statistics support our conclusions. They indicate that in the models of both pairs of aspirations the instruments (the exogenous characteristics of the non-overlapping peers) correlated sufficiently with the endogenous regressors (the average aspiration level of friends) and show that the endogenous regressors should have been treated as endogenous. This validated the use of instrumental variable estimation and the peer effect results. Only in the first pair of aspirations the IV test statistics revealed

that the instruments were weak and that the endogenous regressor should have been treated as an exogenous variable. The OLS estimate, however, did not reveal a significant peer effect when students trade off economic independence against peaceful relations with relatives. The lack of a peer effect may be the result of students nominating many close friends and dense class networks which can cause weak identification. Alternatively, the trade-off between economic independence and maintaining peaceful relations with relatives may be less relevant to high school students, suggesting that students discuss this trade-off between the two aspirations with their peers less than the other two trade-offs. As a result, the aspiration levels of peers cannot be directly observed, and students are unable to conform their individual aspiration level to the average aspiration level of their friends.

5.2.3. The influence of competitive envy and destructive envy on effort

While the two previous empirical chapters focus primarily on aspirations, the fourth chapter takes effort as starting point. Effort is a crucial instrument in the process of attaining aspirations (i.e. from aspiration to behaviour) and is influenced by social comparison through two types of envy. The first type of envy is labelled competitive envy and exposure to other peers should increase effort to keep up with or stay ahead of others. Competitive envy implies that inequality between peers has benefits for society, which increase welfare. The second type of envy is labelled destructive envy. Here, inequality and exposure to successful peers may harness malicious feelings of aversion and dislike which result in social sanctions like exclusion and harassment. Under such circumstances, success has social costs, and successful peers may lower their effort to minimise differences with less successful peers. Destructive envy implies that inequality between peers bears costs for society which lower welfare.

To get insight into the costs and benefits of inequality for society, the fourth chapter presented a real-effort experiment. In total, 256 students performed a counting task that measured their effort invested in two consecutive rounds. Students could earn money with each table correctly solved. Together with a control treatment, three treatments were implemented: a treatment where students received feedback at the beginning of the second round on their performance relative to fellow group members, a treatment where students received an announcement at the start of the second round of effort that money-burning opportunities would be offered afterwards, and a

treatment that combined both. For each treatment a hypothesis was tested: 1) exposure to relative performance feedback would increase effort, 2) exposure to the threat of money burning would decrease effort, and 3) a combination of both would decrease effort even more, as relative performance feedback on a first round of effort would give participants a better idea of how they would rank in a second round, which would make them more sensitive to the threat of money-burning.

The chapter used an individual-fixed effects regression that allowed an examination of the change in effort between two rounds within treatments and between treatments. The results revealed that subjects who received feedback on how they performed relative to fellow group members increased the number of correctly solved answers and the final earnings more than subjects in the control treatment. The results also revealed no differences between the control treatment and the treatment with the money-burning announcement. However, when combined with relative feedback in a fourth treatment the change in number of tables attempted and the number of tables incorrectly solved was lower than in the control treatment. The chapter concluded that subjects anticipated on others to target them with money-burning if they performed well, and they pre-cautiously would lower their effort to avoid such costs.

To examine what drove the various forms of envy the treatment effects were interacted with wealth quintiles. The results demonstrated that the poorest students were sensitive to receiving feedback and increased their effort, whereas the wealthiest students were sensitive to the threat of money-burning and lowered their effort. This suggested that students expect others to take account of their wealth status outside the experiment. Wealthier students expected their fellow group members to target them mainly because of their wealthy background, which could justify money-burning decisions.

5.3. New insights and contributions to the literature

The introductory chapter of this thesis presented a large number of studies that examine youth aspirations and how they are shaped by the social context in developing countries. Most of these studies, however, are one dimensional and focus on one type of aspiration, or do not take account of the endogenous interaction between aspirations and the social context in which they are shaped. This thesis offers three clear-cut

contributions, and each of the empirical chapters in this thesis provides a distinct insight that adds to the existing literature on aspirations.

First, the chapter on gender differences in aspirations provides an original conceptualisation of trade-offs in aspirations, and anchors them extensively in the local research context. Apart from Bernard and Taffesse (2014), the multidimensionality of aspirations is vastly under-researched, and the same type of indicators are applied to extremely diverse social and cultural contexts. The conceptualisation used in this thesis is in line with Camfield (2015), who made the observation that a lot of studies conclude that poor people are poor because they have an inadequate capacity to aspire, which neglects the structural causes of poverty that affect that capacity in the first place. The results in this study demonstrate that instead of focusing on a limited capacity to aspire, research should pay ample attention to the complex process of trading off aspirations poor people face when wanting to better themselves. Poverty does not allow any error of judgement, and there is no room to mitigate a 'wrong' trade-off decision, which adds to the difficulty of the trade-off. For the non-poor, this process is less difficult as mistakes can be corrected. In this thesis, the conceptualisation of trading off aspirations is applied to the aspiration to become economically independent, as it is a determinant of the economic empowerment of young people and girls in particular. Altogether, the data presented in the second chapter validate the concept of trading off aspirations, and present evidence that various alternative aspirations have an influence on the intensity to which youngsters aspire to obtaining their economic independence.

The second contribution of this thesis is applying the non-overlapping peers' approach to stated preferences. The literature on non-overlapping peers has mainly focused on peer effects in behaviour, like substance use, school enrolment, and school results. Moreover, and perhaps more importantly, although peer influences in aspirations have been studied (Beaman et al., 2012; Bernard et al., 2014; Macours & Vakis, 2014), the influence of endogenous peer effects on aspirations through social networks has not yet been topic of study. The results of the third chapter add to the understanding of how aspirations are transmitted socially and provide evidence on the powerful role that social networks play therein.

Third, the design of the real-effort experiment is innovative as it allows to disentangle two types of envy that result from social comparison. The results present evidence that envy is a double-edged sword, which can either be beneficial or costly to society. Apart from Bursztyn and Jensen (2015), and to the best of our knowledge,

no study has looked into anticipated behaviour, and how people aim to avoid the social cost of success that results from destructive envious behaviour (or antisocial behaviour as some studies like D. Fehr (2018) call it) of peers. It is often assumed that such costs are only reflected in the earnings reduced by envious peers, or in the willingness to pay to reduce the earnings of others. This chapter adds to that by showing that a reduction in effort to avoid social repercussions also bears hidden costs that should be added to the cost of inequality on welfare. Moreover, in contrast to most studies that use a real-effort experiment, this chapter adds to the literature by defining effort in different ways. Effort is not only quantified as final earnings before and after money-burning, but by looking at the number of correct answers, the number of incorrect answers, and the total number of tables attempted to solve, the quality of effort is also taken into account. This allows capturing how the treatments affect respondents' level of dedication in solving the effort task.

5.4. Policy implications

Despite the increased attention for secondary education in Uganda, most young Ugandans still work in subsistence agriculture, in informal sector jobs in urban centres, or are simply unemployed. However, in the greater Mbale area in Uganda, 50% of the population is under the age of 15, which holds a great potential for development of the region (Uganda Bureau of Statistics, 2018b). For young people, and girls in particular, setting up small-scale businesses is a realistic and productive option for generating an (independent) income. The results presented in the second chapter, however, reveal that youngsters face various internal constraints when trying to become economically independent. Especially girls aspire to social alternatives more than boys, which could affect their economic empowerment in the long run and risks perpetuating existing gender inequalities. Policies that aim to address the economic empowerment of girls should therefore not only promote entrepreneurship and provide vocational training on the technical aspects of running a business, to lift the economic aspirations of those treated, but should also address social empowerment issues. More specifically, social empowerment should focus on raising awareness among youngsters on the consequences of early marriage, childbearing, and dependence on men to break down internalised dominant gender roles that shape aspirations, constrain young women's

economic empowerment and maintain gender inequalities. Such programmes can then be very effective when targeting girls at a young age (Heckman & Mosso, 2014).

After the design phase of an empowerment programme, deciding on who to target and include in the intervention is a second step. The results of the third chapter point out that peer effects have an influence on aspirations. Policy-wise, that means that potential treatment effects can spill over to individuals who have not been part of the programme. For example, to raise the economic aspirations of girls and address social empowerment issues in a classroom it is not required that every girl in that classroom takes part in the programme. Aspirations of non-treated girls can still be changed through the aspirations of treated girls in their group of close friends. The existence of endogenous peer effects in aspirations implies that a change in the average aspiration level of a girl's group of friends spills over to the individual aspiration level of the girl, as she conforms her aspirations to that of her friends'. Reaching a desired outcome with less participants could then make empowerment programmes less costly, which means that with a similar budget successful interventions could be implemented in a larger area.

Last, one of the elements of an empowerment intervention aimed at increasing the productivity of youngsters is exposing them to successful peers or role models with whom they can identify. The results of the fourth chapter demonstrate that such an intervention can be effective in the absence of the threat of destructive envy and could render feelings of competitive envy. The results of the second treatment show that relative performance feedback increased the average welfare (earnings), although not for the poorest individuals. However, in societies with strong egalitarian norms that motivate destructive envious behaviour the implementation of an intervention that emphasises inequality and differences between the treated individuals and the role models presented (i.e. similar to the fourth treatment of the experiment which reveals inequality in performance and provides the opportunity the reduce the earnings of fellow group members) may have an adverse effect. Not only are individuals not motivated to keep up with successful role models, role models may even become the target of destructive envious behaviour (Charness et al., 2013). Especially for wealthy individuals, and we assume that role models in the community are among those individuals relatively well off, a combination of the threat of destructive envy and destructive envious behaviour from others lowers their welfare. Under such conditions, policies that advocate for equal opportunity will be more effective. These

equal opportunities should then guarantee poor people equal access to financial capital, land ownership and rights, and education, while eliminating any discriminatory legalisation and social norms.

5.5. Limitations and avenues for future research

There are a number of limitations that need to be taken into account when interpreting the results presented in this thesis. For each empirical chapter the limitations of the conceptualisation or design are highlighted, together with avenues for future research.

In the first empirical chapter, the aspirations of boys are compared with the aspirations of girls. These girls, however, come from very different socioeconomic background. The unequal gender composition of the sample already points at a gender gap in school enrolment, and the differences in socioeconomic characteristics also reveal that girls need to come from 'better' households to be enrolled in secondary school. These compositional differences raise the question whether a comparison between boys from low socioeconomic class and girls from higher socioeconomic class is valid. Moreover, to examine gender differences in aspirations of youngsters, a Senior six class is perhaps a place where one would find the smallest gender differences. In general, boys and girls enrolled in Senior six are among the elite youth who have been able to complete secondary school. This is evidenced by the official gross school attendance ratios.[36] In Eastern Uganda, the gross attendance ratio for primary school is 132.5, but this ratio drops to 21.4 for secondary school attendance (Uganda Bureau of Statistics, 2018b). Favara (2017) shows that students with low educational aspirations drop out of school early in Ethiopia, and only a selected group of students with high educational aspirations, or with parents with high educational aspirations for them, are able to stay in school. Although this thesis presents a valid reason for conducting the study among students (e.g. to avoid justification bias), it is expected that focusing on boys and girls who have dropped out of school would result in larger gender differences. However, especially girls who have dropped out of schools have already made a 'choice' for, or are forced into, more traditional gender roles. Roles that are linked, for example, to marriage and fertility. Altogether, these

[36] The gross attendance ratio is the total number of school students, expressed as a percentage of the official school- age population (Uganda Bureau of Statistics, 2018b).

considerations indicate that our findings are most likely underestimates of gender disparities in aspirations.

Another limitation that is relevant to the first two empirical chapters is the direct approach with which aspirations were elicited. The problem that Bernard and Taffesse (2014, p. 13) highlight with such a direct approach is that participants may have reported their general wishes, instead of their actual preferences. Perhaps it would have been an improvement to have developed the currently used stated preference technique into a behaviour choice experiment with a vignette approach. The aspirational dimensions would then be further developed into attributes (each aspiration would be an attribute in this approach) with at least two discrete levels (i.e. with minimum and maximum outcomes of what people consider realistic in the research area), providing a more detailed operationalisation for each dimension. This would tackle the problem that Bernard and Taffesse (2014) point out. After selecting the appropriate aspirations and their levels, a fully crossed design could be set up, resulting in a multitude of possible scenarios. Assuming that six aspirations are included with each two levels, the design would result in sixty-four possible scenarios (the number of levels to the power of the number of possible alternatives; 2^6). To practically conduct the choice experiment, an orthogonal design would be carried out as part of a conjoint analysis, selecting a subset of the total set of possible alternatives. This would create a fractional factorial design, presenting a suitable subset of possible combinations of aspirations and their levels. This subset would capture the main effect for each level and reduces the correlation between any of the levels to determine what the trade-off between them would be. The response variable for each participant will then be a utility score per aspiration. To present the scenarios to respondents, the method could illustrate the scenarios on vignettes (e.g. sheets depicting different combinations of the levels of the six aspirations). In addition, this method would also allow transivity.

A third limitation of this study relates to how friendship ties were elicited. In the non-overlapping peers' approach suggested by Bramoullé et al. (2009) the strength of the instruments in the instrumental variable estimation is strongly related to the density of the networks. Some studies (Fortin & Yazbeck, 2015; Lin, 2010) that investigate peer effects use a questionnaire with a cap on the number of friends a respondent is allowed to report. This does not capture the entire friends network but ensures sufficient non-overlapping peers to allow identification. This thesis aimed to

capture the entire friends network and did not put a cap on the maximum number of friends. As a result, the networks elicited are more complete which allows us to capture potential peer effects. However, the networks per class are also denser, as can be seen in the network graphs in Appendix B.2, which makes that the group of non-overlapping peers is smaller than when a cap on the number of friends would have been used. Consequently, as the number of non-overlapping peers is crucial in the approach used, the strength of the instruments weakens and identification of the peer effect becomes more difficult. A solution to this limitation would be to only study the mutual ties (i.e. nominated ties that are reciprocated) in the classroom, but due to the limited sample size this was impossible. A simple and straightforward, but more fruitful solution would have been to have let students make a distinction between their best friends, with a cap on five friends, and their remaining close friends. This would also have allowed an examination on whether the effect of the nominated best friends is stronger than a possible effect of the remaining close friends.

Moreover, the sample size in combination with the instruments used in the third chapter already made identification difficult, as more instruments (included and excluded instrument) were used than clusters (classes) needed for class-level fixed effects. As a result, it made studying any contextual effects impossible (e.g. the effect of group composition as peer effect on the aspirations of an individual), as all exogenous variables needed to be partialled out to allow identification of the peer effect.

Last, the design of the real-effort experiment may require improvement. The current design allowed the inclusion of 16 students per treatment, and 64 students in total per experimental session. In practice, this turned out to be difficult to run in an organised manner, especially in the often basic, small classrooms at the school locations. For example, the lack of an effect of the threat of money-burning could very well be caused by the sometimes cramped classrooms in which the treatment was implemented. A lack of privacy could not only have impacted the actual money-burning rate, but students may also have anticipated that money-burning would probably not take place because of the lack of privacy, and therefore a downward adjustment of effort was not required. Alternatively, students that sat close together may also have subtly influenced each other which stimulated some form of competition, balancing out the effect of the threat of money-burning.

This privacy issue could have been tackled if the entire experiment was made anonymous. Social interactions can be too thick to include in the experiment. If respondents know their group members, their behaviour may be completely based on previous social interactions and relations, making it difficult to attribute behaviour to the three interventions. In practice, to guarantee full anonymity, the design of the real-effort experiment requires at least 8 participants divided over two groups to take part per treatment. That said, group identity may be an important determinant of destructive envy. Gender group composition, for example, may interact with the treatment effects, and group identity and group similarity may then reveal the circumstances in which inequality is tolerated, and when it is considered inappropriate.

Another limitation of the design of the real-effort experiment results from the combination of money-burning and performance feedback in the fourth treatment. Consequently, the money-burning in the fourth treatment is inherently different from the money-burning in the third treatment. As participants in the fourth treatment know how fellow group members have performed in a previous round of effort, their money-burning decision may very well be based on that, even though the decision itself is only applicable to the earnings of the second round. More importantly, it implies that the anticipation of the threat of money-burning is also linked to how well the individual has performed in the first round. Related to this is then the interconnectedness between money-burning decisions. A money-burning decision may have been based on the anticipated money-burning decision of others: a participant decided to reduce the earnings of others based on the expectation that they will reduce his or her earnings. This would change the money-burning decision into some sort of precautious retaliation, especially if participants know each other. To disentangle the money-burning decision it could be worthwhile for future real-effort experiments that contain a money-burning element to ask participants after they indicated their money-burning decision how much they expect the other members to burn, on average. This might then be included as additional control variable in the analysis.

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Appendices for Chapter 2

Appendix A.1. Defining Aspirations in Lugisu

Introduction

This appendix explores data from seven focus group discussions (FGDs) conducted in May 2015 in the Greater Mbale area, Eastern Uganda, a region mainly inhabited by the Bagisu people. The data from the FGDs are aimed at exploring local definitions of aspirations. A stratified sampling approach was applied and seven neighbouring villages were selected. The FGDs were primarily set up as a preparatory exercise, and the provisional findings are believed to provide essential input to further designing the research methods.

Based on Appadurai (2004) and Bernard et al. (2014), the following working definition of aspirations is used during the data collection phase: ‘mid-term life goals that are realistically achievable as a result of one's individual actions’. This definition coincides with the five core elements derived from the two studies, which are considered to epitomise aspirations: aspirations are future oriented and determine behaviour; they are motivators, determining how much time, effort, and capital is put in attainment; they span multiple life dimensions like health, wealth, education, and social status, suggesting there may be a possible trade-off between them; they change over time due to life experiences; and they are attitudinal, making direct observations impossible. This appendix shows similarities between these characteristics and local perceptions and definitions of aspirations.

Data Analysis

The data analysed are qualitative in nature, containing the transcripts of seven FGDs. The FGDs were conducted by a male Ugandan research collaborator with ample experience in data collection, and belongs to the same ethnic group (Bagisu) as the majority of participants taking part in this thesis. Participants were approached by local mobilisers in their communities. As the design of the FGDs aimed at an equal division of male / female and young (18-40) / old (41-75), the research collaborator instructed

the mobilisers prior to the FGDs. FGDs were held in Lugisu, the dominant language in the research area, and recorded by means of digital recording devices.

In total, 107 respondents participated in the seven FGDs. Before the start of the session, they were asked to fill out a short screening survey registering their socio-demographic characteristics, and an overview of the descriptives can be found in Table A.1. The average age of participants was 39 years and less than half of them were female. Average household size was slightly over 6, and the vast majority of participants reported a Christianity as religious background (though probably with various sub-denominations, which were not included in the screening survey), the vast majority was married were from the Bagisu ethnic group.

Table A.1. Socio-demographic characteristics participants FGDs

	Mean	**SD**
Age	39.21	13.71
Household size	6.03	2.46
Female	0.44	0.50
Christianity	0.87	0.34
Married	0.88	0.33
Bagisu tribe	0.97	0.17
Observations		107

As the outline of the FGDs was designed to cover a fixed number of topics, potentially allowing comparisons between the outcomes of the FGDs possible, the analysis of the data follows a thematic approach with codes established prior to data collection. They represent the three main elements of the FGDs (making up the ‘start list’). Structuring the data is then done according to the work of Miles and Huberman (1994, p. 56), who state that in order to avoid data overload and to help with keeping an open vision, systematically assigning codes and labels to descriptive information is essential and creates a relational structure.

According to Hollander (2004) and Smithson (2000), a relevant concern when analysing FGDs revolves around group dynamics and interactions, which need to be taken into account when trying to understand the texts, transcripts, and other outcomes of group discussions and exercises. The relationship among participants (and the male facilitator) and the social structure in which the discussions take place influences the data generated, and Miles and Huberman (1994) point out that transcripts of the

discussions often fail to capture such group dynamics. Therefore, outcomes of this analysis should be treated as non-static, and can only offer a socially constructed reality of what might be considered a relevant discourse on aspirations in the FGD context. Hollander (2004) suggests that the FGDs should be regarded as a space where social interaction was observed, and not so much as an instrument collecting individual level data. This consideration also holds for the interaction between the participants (especially female) and the male research collaborator.

Defining aspirations in Lugisu

The participants of the FGDs were informed about how the facilitator understood aspirations, using examples of five aspirations relevant to the research collaborator's living conditions, and based on the definition of aspirations provided in this appendix. By referring to his own aspirations, the research collaborator emphasised that aspirations are long-term life goals that should be realistically achievable, span multiple dimensions, can only be achieved by individual effort, and are future oriented (within 5 years). Participants were then asked which wordings in Lugisu they use to describe aspirations.

For this analysis, the facilitator translated their responses in English, entailing the risk of possibly influencing the reliability of the interpretations and descriptions provided in this section. This aspect was taken into account during the analysis, but is not expected to have a profound influence on the results. The notes and transcripts on how respondents perceive aspirations reveal frequently used wordings. After coding, these associations and interpretations were divided over five categories that illustrate characterisations of aspirations they are reported to represent. The overview that follows in the next section, however, is descriptive in nature and does not profess to give any deeper interpretation or linguistic analysis.

Firstly, aspirations are associated with *'kutamba ni gamani'*, *'kweza kuba bulayi mu maso'*, and *'kwilwanako mu maso'*, meaning 'to work very hard', 'to become well off in the future', and 'to fight for yourself for the future', respectively. These transcriptions appear to point out that aspirations are associated with a certain amount of effort needed for attainment. Such (an) interpretation also implies that aspirations are perceived as being future oriented, as *'maso'* (future) is a recurring term in many of the wordings. Secondly, the majority of definitions reported tend to revolve

around individual development. *'Kwamamo'*, *'kwiyamamo'*, and *'kugana kwamamo'*, are wordings that refer to 'coming out', a local term referring to dreams coming out and being successful. The same interpretation is given to *'kwiyombeka'*, understood as 'building oneself'. Thirdly, other descriptions associate aspirations with hope or being hopeful. *'Kusubila'* or *'kusubila kukola'* means 'to hope' and 'hoping to do'. It could also imply there is a certain desire to achieving a particular goal, automatically linking to the fourth category which revolves around goal achievement or attainment. *'Bufunisi'*, meaning 'the way of getting something', and *'kuba ni kyigendererwa'*, meaning 'to have an intention', also point out a certain desire to achieve. That also holds for *'kuba bulayi'* and '*kuba umuyindi'* meaning 'to bring about a good life' and 'being wealthy', and *'kyiloto'*, translated as 'a dream'. A vast amount of definitions, however, include the element of organisation, albeit depicted as preparing, planning, and thinking. *'Kupangala'* is derived from the verb 'to plan' in English, and incorporated in the Lugisu language. *'Itegeka'* and *'kwitegekera bulumi'* means 'preparation' and 'to organise for one's own life' respectively, and *'kwambasa mu maso'* means 'to think ahead/about the future'. Table A.2. illustrates an overview of all Lugisu wordings and definitions used, together with their English translations.

Altogether, any future data collection instrument aimed at eliciting aspirations needs to demonstrate sensitivity towards the way aspirations and their conceptualisation are introduced to respondents. These above-mentioned local definitions and wordings, therefore, provide valuable input towards framing and introducing aspirations, and the research topic more generally, resulting in appropriate connotations (as representative domains of meanings) that are expected to increase the content validity of a future data collection instrument.

Table A.2. Local definitions of aspirations FGDs

Lugisu	English
Ali ni kyibaso kyekukola	He has a thought or an idea of doing (something)
Bufunisi	The way of getting something
Kuba ni kyigendererwa	To have an intention
Kusubila	To hope
Kusubila kukola	Hoping to do
Kuba bulayi	Being well
Kuba umuyindi	Being rich or wealthy
Kwamamo	To come out
Kwiyamamo	To come out of oneself
Kugana kwamamo	Wanting to come out
Kugana kwiyombeka	Wanting to build yourself or wanting to develop
Kuleta ikulakulana	To bring development
Kuleta inzowazowana	To bring about development
Kuleta kuba bulayi	To bring about a good life
Kwiyombeka	Building oneself; developing
Kyiloto	A dream; or aspiration
Kutamba ni gamani	To work very hard
Kweza kuba bulayi mu maso	To become well off in the future
Kwilwanako mu maso	To fight for yourself in the future
Kutegeka	To prepare; to organise
Kupanga magesi	To organise knowledge or to come up with ideas
Kupulaninga	To plan (bears similarities as word has become part of Lugisu)
Kukuba zi pulani oba Kupulaninga	To make plans or planning
Kuplaninga bulamu	To plan life
Itegeka	Preparation
Kutekateka	To arrange
Kwitegekela bulamu	To organise for one's own life
Kwitegekera	To organise for oneself
Kwitekatekela	To arrange for oneself
Kulowoza/Kwambasa	To think
Kwambasa mu maso	To think ahead/about the future
Kwiyiya	To survive
Kyilowozo	A thought
Kuba nga nisobola	To be capable of doing something without depending on others
Kuyeda batu	To help people

Appendix A.2. Interview script

The script includes two parts: the first part of the script aims to record basic socio-demographic characteristics of the participants, whereas the second part aims to reveal potential trade-offs between aspirations and examine the elaborations given.

Name interviewer:

Date of the interview:

Part 1. Personal details Respondent

Before we start this interview, we would like to register a couple of basic details:

Name:
Age:
Area:
Gender:
Religion:
Ethnic background:
Highest level of education (finished):
Number of (permanent) members in household:
Marital Status:
Main income generating activity:

Part 2. Introducing aspirations & trade-offs

The second part of this interview focuses on what you, as individual, consider important aspirations for the future. The following questions form the core of the transcript:

Q1. What do you think are aspirations? Can you give examples? [THIS IS A 'CHECK' QUESTION]

Explain aspirations: We are interested in what you think of doing and achieving in the future for yourself. Every one of us has something planned to do or to achieve in the

next 5 to 10 years, and these activities or achievements are based on what we think is **realistically** possible for us, and whether we can accomplish them through our own individual effort. That means we are not talking about things we just admire; we have to work for it. Aspirations are therefore described as: "Mid-term life goals that are realistically achievable as a result of one's individual actions". We are primarily interested in your personal preferences, so we would very much like to emphasise there are no good or bad answers.

Put the aspiration cards on the table and explain each aspiration individually.

Q2. Which of these aspirations do you prefer, and are for you realistically achievable in the next 5 to 10 years?

Aspirations	**Selected by participant**
Getting a stable income over time	
Being in the proximity of your family and relatives	
Being well regarded among your family and friends	
Becoming wealthy	
Becoming part of the modern world	
Getting a well-regarded job	
Becoming independent without anybody's control	
Getting children	
Starting an own business	
Obtaining higher education	
Becoming an active member of your community	
Getting married	
Being able to decide what happens in the household	
Building an own house	
INSERT participant's aspirations not on card:	

You can pick as many cards as you want, and please put them central on the table. Naturally, it can also be that you don't prefer any of the aspirations mentioned. Do you have any aspirations that are not on the card, but are very relevant for you?

Q3. Why do you consider these aspirations important to you? [ALL ASPIRATIONS PREFERRED AND MENTIONED] Can you elaborate on each individual aspiration? DEPENDING ON PARTICIPANT'S ANSWERS: In what kind of context do you see that?

Now move to the aspirations that were not selected by the participant.

Q4. Why do you consider these aspirations less or not relevant for your current life circumstances? Please elaborate on each aspiration separately.

Put the selected and unselected aspirations in two separated groups on the table.

Q5. For each of the aspirations you have chosen, is there also an aspiration that is very difficult or even impossible to pursue at the same time? These aspirations can be both from the set you have selected and from the set you have left untouched. Can you make pairs of such 'conflicting' aspirations?

Once aspirations are paired as conflict, new pairs can still be made with the same aspiration(s) from the previous pair. So, ask the participant to point out ONE pair at the time.

Q6. Some of the aspirations you mentioned might lead to other aspirations. They are a means, a tool, or an instrument for reaching something else. Can you make pairs of aspirations, depicted on these cards and those that you might have mentioned additionally, of which you think are related to each other? Can you also explain why? KEEP THE CARDS ON THE TABLE.

Tell the participant that we have come to the end of the interview, thank the participant, and ask whether they have any questions or comments about the research. Please point out that if the participant has any questions or comments in the future, they can contact Joshua or Rik via e-mail, which is mentioned on the information sheet.

– End –

Appendix A.3. Overview of participants open-ended interviews

Participant	Age	Gender	Location	Date interview
R1	18	Female	Busulani (Sironko)	November 5th, 2015
R2	19	Male	Busulani (Sironko)	November 5th, 2015
R3	20	Male	Busulani (Sironko)	November 5th, 2015
R4	21	Female	Busulani (Sironko)	November 5th, 2015
R5	18	Female	Busulani (Sironko)	November 6th, 2015
R6	21	Male	Busulani (Sironko)	November 6th, 2015
R7	20	Female	Busulani (Sironko)	November 6th, 2015
R8	18	Male	Busulani (Sironko)	November 6th, 2015
R9	19	Female	Busulani (Sironko)	November 7th, 2015
R10	21	Male	Busulani (Sironko)	November 7th, 2015
R11	20	Female	Buyobo (Sironko)	November 7th, 2015
R12	19	Male	Buyobo (Sironko)	November 7th, 2015
R13	19	Male	Buyobo (Sironko)	November 9th, 2015
R14	18	Female	Buyobo (Sironko)	November 9th, 2015
R15	20	Male	Buyobo (Sironko)	November 9th, 2015
R16	21	Female	Buyobo (Sironko)	November 9th, 2015
R17	21	Male	Buyobo (Sironko)	November 10th, 2015
R18	19	Female	Buyobo (Sironko)	November 10th, 2015
R19	19	Male	Buyobo (Sironko)	November 10th, 2015

Participant	Age	Gender	Location	Date interview
U1	21	Female	Mbale	November 12th, 2015
U2	22	Male	Mbale	November 12th, 2015
U3	22	Female	Mbale	November 12th, 2015
U4	19	Male	Mbale	November 12th, 2015
U5	18	Female	Mbale	November 13th, 2015
U6	23	Male	Mbale	November 13th, 2015
U7	18	Female	Mbale	November 13th, 2015
U8	20	Male	Mbale	November 13th, 2015
U9	20	Female	Mbale	November 14th, 2015
U10	21	Male	Mbale	November 13th, 2015
U11	23	Female	Mbale	November 14th, 2015
U12	20	Male	Mbale	November 14th, 2015
U13	18	Female	Mbale	November 16th, 2015
U14	19	Male	Mbale	November 16th, 2015
U15	23	Female	Mbale	November 16th, 2015
U16	18	Male	Mbale	November 16th, 2015
U17	21	Female	Mbale	November 17th, 2015
U18	19	Female	Mbale	November 17th, 2015
U19	20	Male	Mbale	November 17th, 2015

Appendix A.4. Survey questions on paired aspirations

Instructions

In this section, we are interested in what you as a person aspire and would like to achieve in the next 5 years, and we would like to emphasise there are no right or wrong answers here.

Every one of us has something planned to do or to achieve in the next 5 years. they are based on what we think is realistically possible for us, and whether we can accomplish them through our own individual effort. That means we are not talking about things we just admire; we have to work for it. Aspirations are therefore described as: "mid-term life goals that are realistically achievable as a result of one's individual actions".

Below in the [blue] boxes, we present two aspirations at the same time. These aspirations could conflict with each other, meaning that both aspirations cannot be pursued at the same time; one has to be sacrificed or postponed for the other. On the tablet, you first see a description of the two aspirations, followed by a question on whether you agree or disagree with the idea that these two aspirations are conflicting. Last, we ask you to indicate which aspiration you prefer over the other by dividing 10 coins over them.

Questions

1. Becoming Economically Independent (A) - Becoming an active community member (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). Becoming an active member of your community. You are a member of various groups [think about savings-, farmers-, women's-, church groups], and you put time

and effort in keeping good relations with neighbours, family, and other community members. Because you know many people, you get information quickly.

These two aspirations could be conflicting; if you invest your time, effort and resources in becoming economically independent, you cannot use them to become an active member of your community at the same time. To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree
4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Becoming an active community member". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to 'Becoming an active member of the community'? ☐

2. Becoming economically independent (A) & living near family and friends (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). Living near family and friends. They will help you out whenever something unfortunate happens to you.

These two aspirations could be conflicting; when you aspire to become economically independent, you cannot live near family and friends at the same time as they will demand financial support from you. To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree
4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Living near family and friends". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to 'Living near family and friends'? ☐

3. Becoming economically independent (A) & getting (more) children (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). Getting (more) children. Your status as parent will increase, and you will be fully occupied with raising them. Your children will help you out with chores in the household and take care of you in later life.

These two aspirations could be conflicting; if you invest your time, effort, and resources in becoming economically independent, you cannot aspire to get (more)

children at the same time, as you don't have time to take care of your child(ren). To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree
4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Getting (more) children". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to ‘Getting (more) children’? ☐

4. Becoming economically independent (A) & living in peace with relatives (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). You are well-regarded by your relatives as you listen to their needs, helping them out with the resources you have available. Because of that, you do not have to fear their jealousy or envy whenever you do well.

These two aspirations could be conflicting; if you aspire to become economically independent, you cannot aspire to live in peace with relatives at the same time, as they will envy your economic independence. To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree
4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Living in peace with relatives". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to ‘Living in peace with relatives? ☐

5. Becoming economically independent (A) & obtaining higher education (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). Obtaining higher education. You acquire knowledge and skills, making you suited for regular salaried employment or prepared for how to effectively set up your own farm or business.

These two aspirations could be conflicting; if you aspire to become economically independent, you cannot aspire to obtain a higher education at the same time, as your studies will need your full attention, time, and funding. To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree

4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Obtaining higher education". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to ‘Obtaining higher education’? ☐

6. Becoming economically independent (A) & getting married (B)

(A). Becoming economically independent. You are able to take care of yourself by putting your time, effort, and resources in developing your own individual income-generating activities.

(B). By getting married, you will gain the respect of your community and you can start planning a family. Your spouse and you support each other, and you will fulfil your obligations as husband or wife.

These two aspirations could be conflicting; if you aspire to become economically independent, you cannot aspire to get married at the same time, as you don't have time and resources to fulfil your obligations as husband or wife. To what extent do you agree or disagree with the statement?

1. Fully disagree
2. Disagree
3. Neither disagree nor agree
4. Agree
5. Fully agree

Imagine there are now 2 cups on the table. 1 with the label "Becoming economically independent" and 1 with the label "Getting married". There are also 10 coins on the table. How would you distribute these 10 coins over the cups? The more coins you put in a cup, the more important the aspiration is to you.

How many coins would you give to 'Becoming economically independent'? ☐

How many coins would you give to ‘Getting married’? ☐

– End –

Appendix A.5. Two-sided t-test. Perception of competition by gender

Paired aspirations	Competition Mean difference
Economic Independence - Getting Married	0.037
	(0.108)
Economic Independence - Getting Children	-0.346***
	(0.109)
Economic Independence - Living in Peace with Relatives	-0.033
	(0.105)
Economic Independence - Living Near Family / Friends	0.015
	(0.106)
Economic Independence - Active Community Member	0.055
	(0.102)
Economic Independence - Obtaining Higher Education	0.013
	(0.111)
Observations	572

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. Standard errors in parentheses. The gender base level is boy. Each row (pair of aspirations) represents an independent two-sided t-test.

Appendix A.6. Gender differences in the weights given in paired aspirations

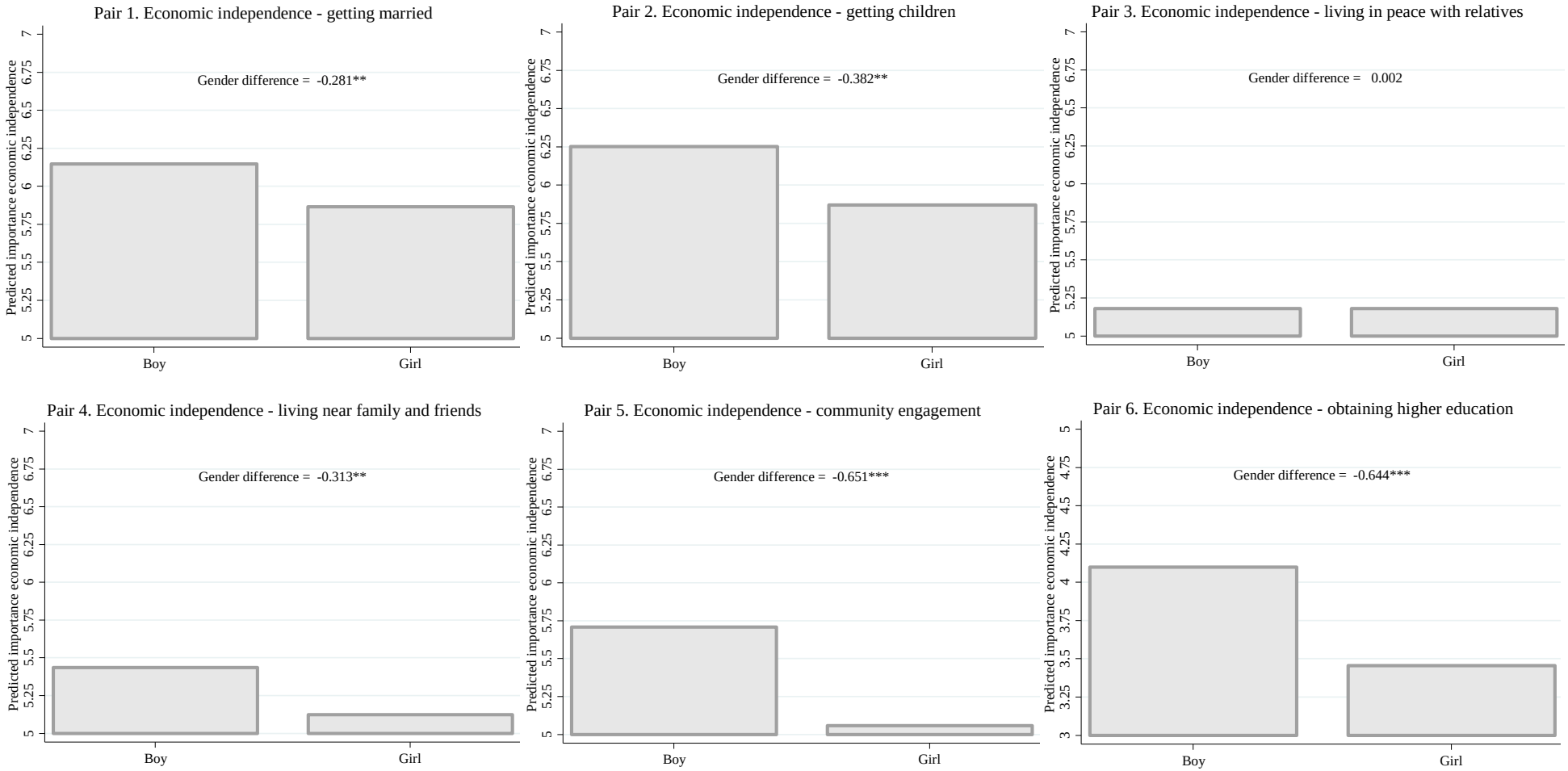
	Pair 1		Pair 2		Pair 3	
	(1)	(2)	(1)	(2)	(1)	(2)
Girl	-0.115	-0.281**	-0.229	-0.382**	0.070	0.002
	(0.158)	(0.118)	(0.182)	(0.171)	(0.188)	(0.192)
Religious participation		-0.002		0.010		0.002
		(0.018)		(0.021)		(0.016)
Birth order		0.004		-0.029		0.012
		(0.025)		(0.030)		(0.022)
Household wealth index (PCA)		-0.093**		-0.049		-0.001
		(0.043)		(0.043)		(0.039)
Father secondary educ. or higher		-0.157		-0.018		-0.178
		(0.260)		(0.201)		(0.268)
Mother secondary educ. or higher		0.393***		-0.242*		0.242
		(0.133)		(0.146)		(0.157)
Locus of control index (PCA)		0.155*		0.214***		0.058
		(0.081)		(0.080)		(0.074)
Income gen. father (ref = died)		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)
Farming		0.201		0.122		0.290
		(0.243)		(0.185)		(0.297)
Running a business		0.058		0.247		0.179
		(0.199)		(0.317)		(0.312)
Salaried employment		0.212		0.057		0.298
		(0.320)		(0.324)		(0.328)
Other activities		0.087		-0.209		0.358
		(0.341)		(0.306)		(0.346)
Income gen. mother (ref = died)		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)
Farming		-0.205		0.273		-0.230
		(0.385)		(0.228)		(0.310)
Running a business		-0.120		0.445		-0.137
		(0.473)		(0.388)		(0.386)
Salaried employment		-0.355		0.699***		0.274
		(0.503)		(0.259)		(0.488)
Other activities		-0.532		-0.125		-0.331
		(0.364)		(0.246)		(0.331)
Constant	6.085***	6.233***	6.195***	6.141***	5.154***	5.088***
	(0.106)	(0.304)	(0.088)	(0.270)	(0.165)	(0.397)
Adjusted R^2	-0.001	0.003	0.001	0.015	-0.002	-0.013
N	572	572	572	572	572	572

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. OLS regression with class level fixed effects. Bootstrapped standard errors clustered at the class level and in parentheses.

	Pair4		Pair 5		Pair 6	
	(1)	(2)	(1)	(2)	(1)	(2)
Girl	-0.200	-0.313**	-0.513***	-0.651***	-0.620***	-0.644***
	(0.171)	(0.154)	(0.146)	(0.175)	(0.155)	(0.157)
Religious participation		-0.003		0.009		0.007
		(0.011)		(0.012)		(0.016)
Birth order		0.080**		0.005		0.032
		(0.037)		(0.052)		(0.029)
Household wealth index (PCA)		-0.068*		-0.027		-0.017
		(0.037)		(0.039)		(0.037)
Father secondary educ. or higher		-0.057		0.118		0.082
		(0.269)		(0.156)		(0.187)
Mother secondary educ. or higher		-0.056		0.073		0.322*
		(0.154)		(0.208)		(0.169)
Locus of control index (PCA)		-0.041		0.091		-0.155***
		(0.098)		(0.074)		(0.056)
Income gen. father (ref = died)		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)
Farming		0.305		0.567*		0.520**
		(0.247)		(0.298)		(0.254)
Running a business		0.324		0.307		0.264
		(0.367)		(0.226)		(0.265)
Salaried employment		0.005		0.535**		0.192
		(0.272)		(0.259)		(0.251)
Other activities		-0.244		-0.157		0.033
		(0.386)		(0.367)		(0.481)
Income gen. mother (ref = died)		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)
Farming		-0.172		0.019		0.171
		(0.250)		(0.354)		(0.280)
Running a business		0.032		0.736***		0.777**
		(0.270)		(0.284)		(0.304)
Salaried employment		0.280		0.935***		0.627**
		(0.361)		(0.261)		(0.301)
Other activities		-0.368		0.061		0.433
		(0.354)		(0.381)		(0.291)
Constant	5.394***	5.197***	5.658***	5.008***	4.089***	3.147***
	(0.130)	(0.343)	(0.177)	(0.503)	(0.123)	(0.184)
Adjusted R^2	0.000	0.003	0.011	0.030	0.017	0.035
N	572	572	572	572	572	572

Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. OLS regression with class level fixed effects. Bootstrapped standard errors clustered at the class level and in parentheses.

Appendix A.7. Predicted weight given to economic independence per pair of aspirations by gender



Notes. * p < 0.10, ** p < 0.05, *** p < 0.01. For each pair the graph reports the gender difference in the weight given to economic independence and its *p*-value.

Appendices for chapter 3

Appendix B.1. Eliciting friendship ties

Name:
School:

Please indicate your relation with your classmates:

1 = you are close friends

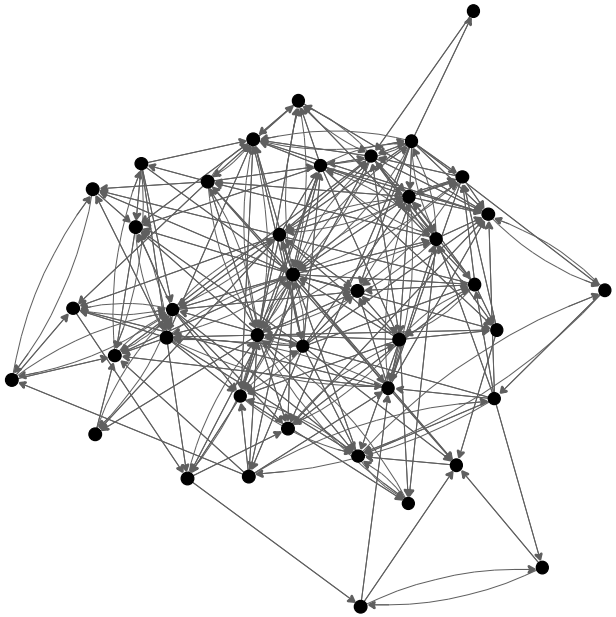
2 = you are getting along well

3 = you do not get along well

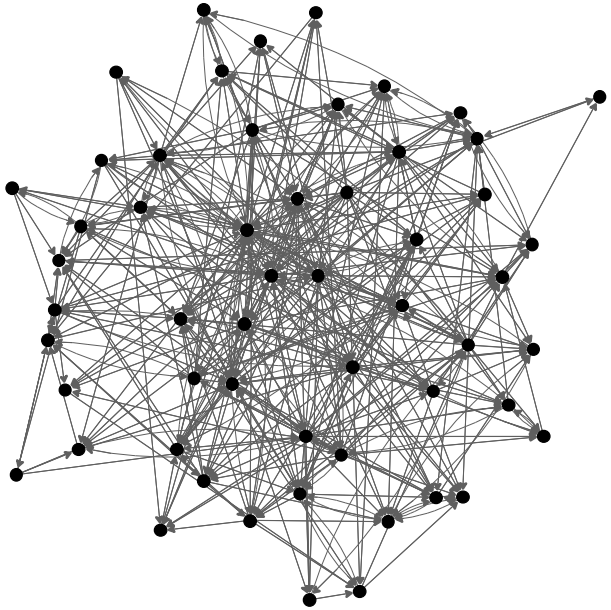
99 = you do not know that person

	Name Student	Indicate your relation by inserting a 1, 2, 3, or 99:
1	[Student 1]	
2	[Student 2]	
3	[Student 3]	
4	[Student 4]	
5	[Student 5]	
6	[Student 6]	
n	[Student n]	

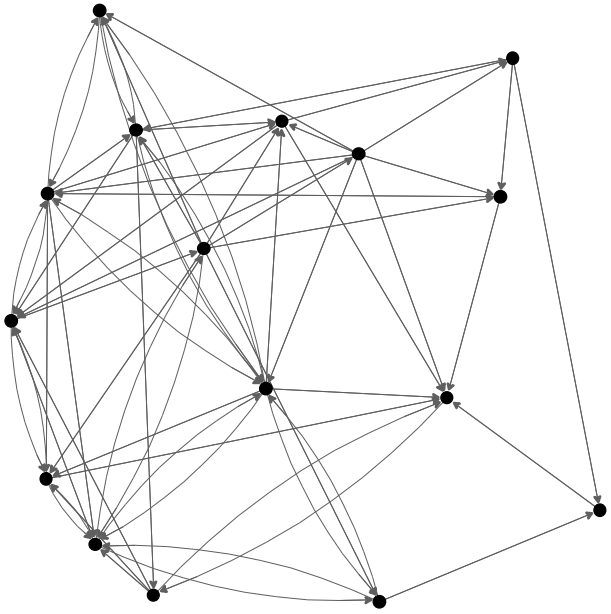
Appendix B.2. Network graphs of nominated ties



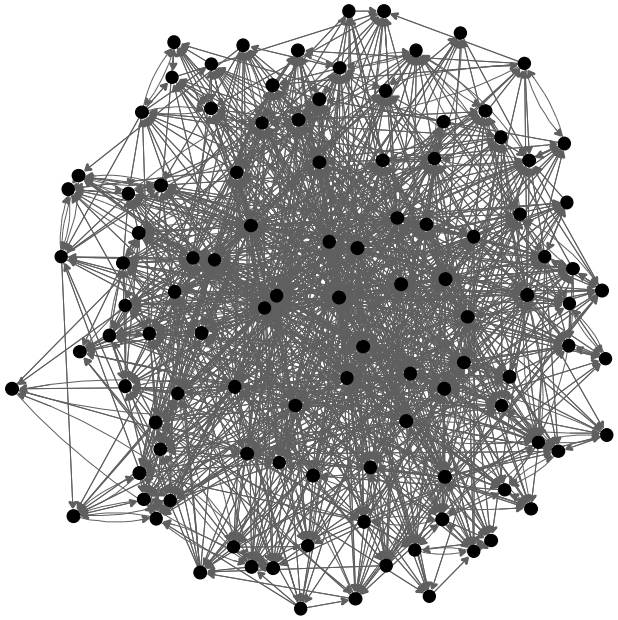
Class 1 (N=40)



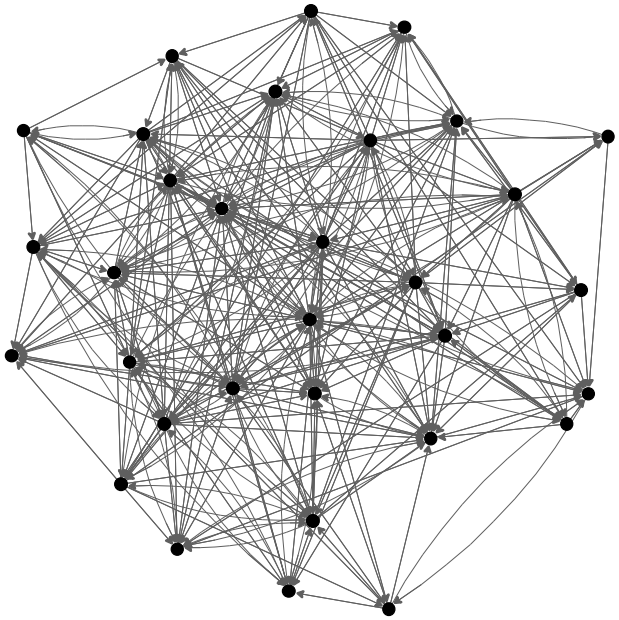
Class 2 (N=55)



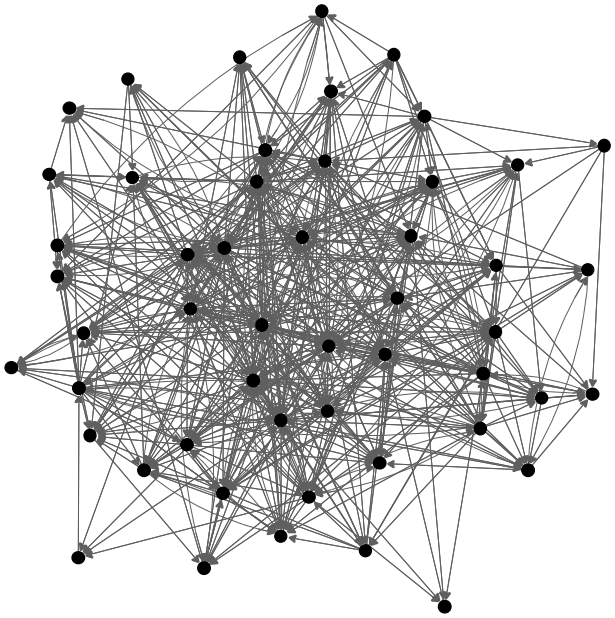
Class 3 (N=16)



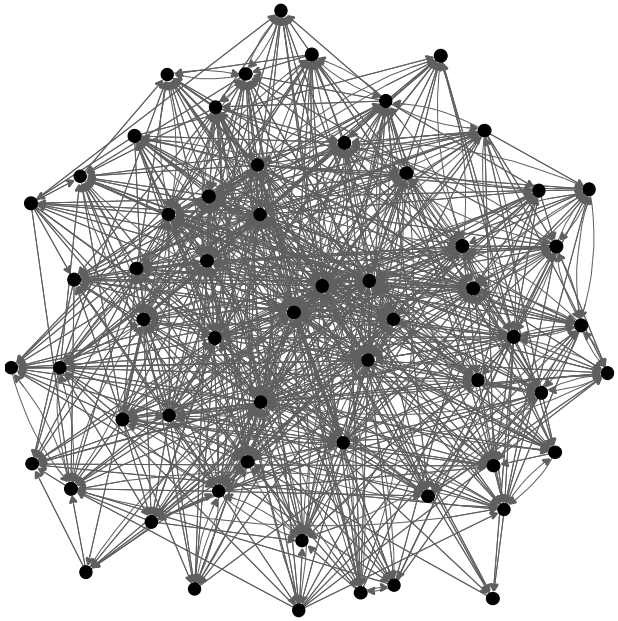
Class 4 (N=107)



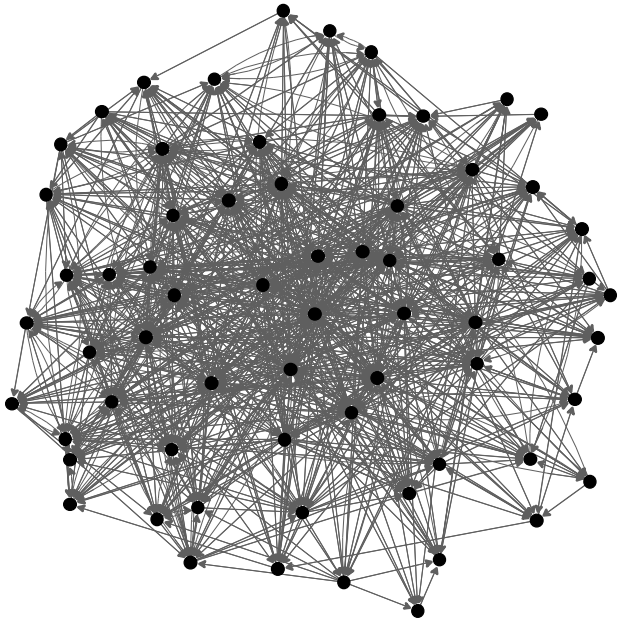
Class 5 (N=32)



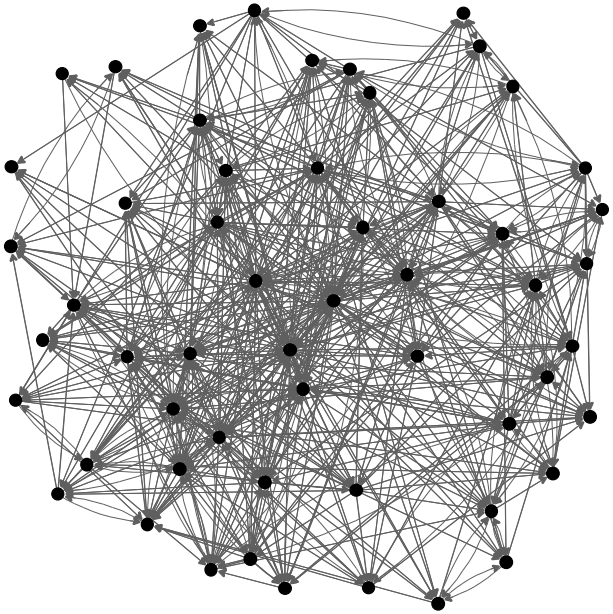
Class 6 (N=51)



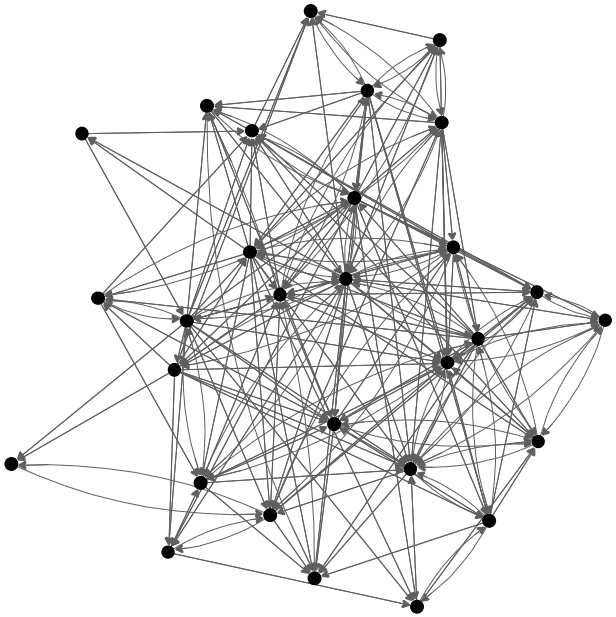
Class 7 (N=59)



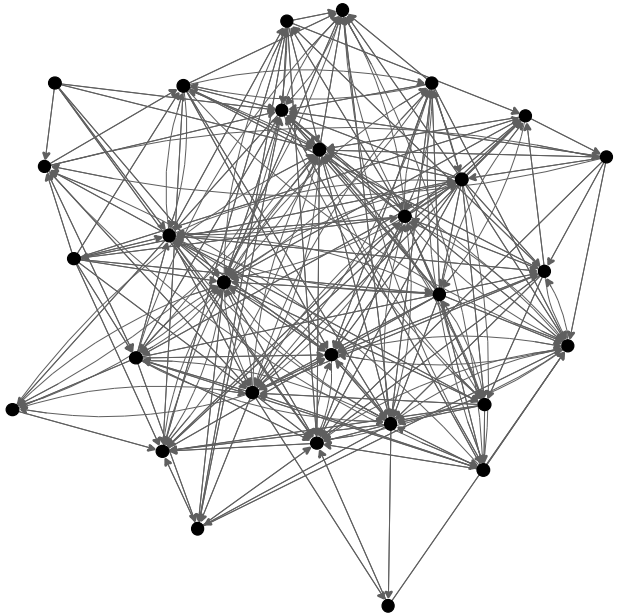
Class 8 (N=65)



Class 9 (N=55)



Class 10 (N=29)



Class 11 (N=29)

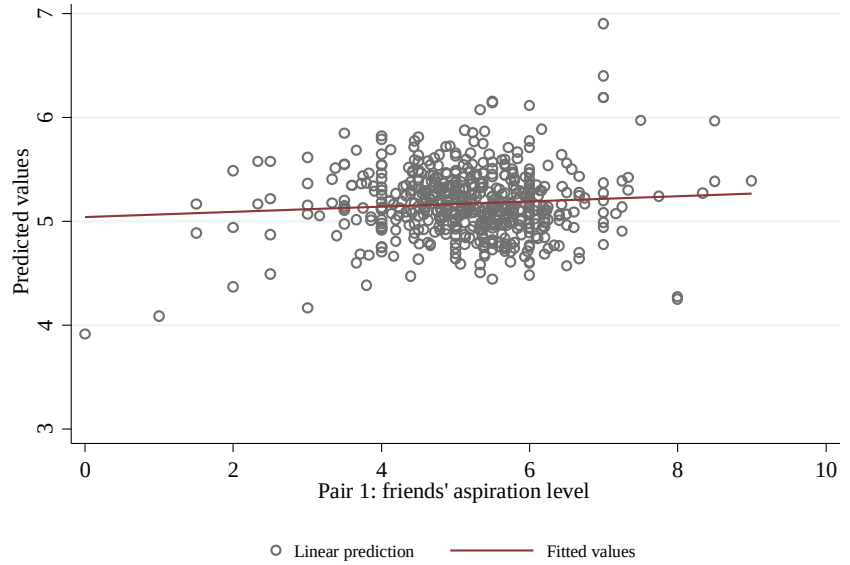
Appendix B.3. Full first stage results IV/2SLS estimation

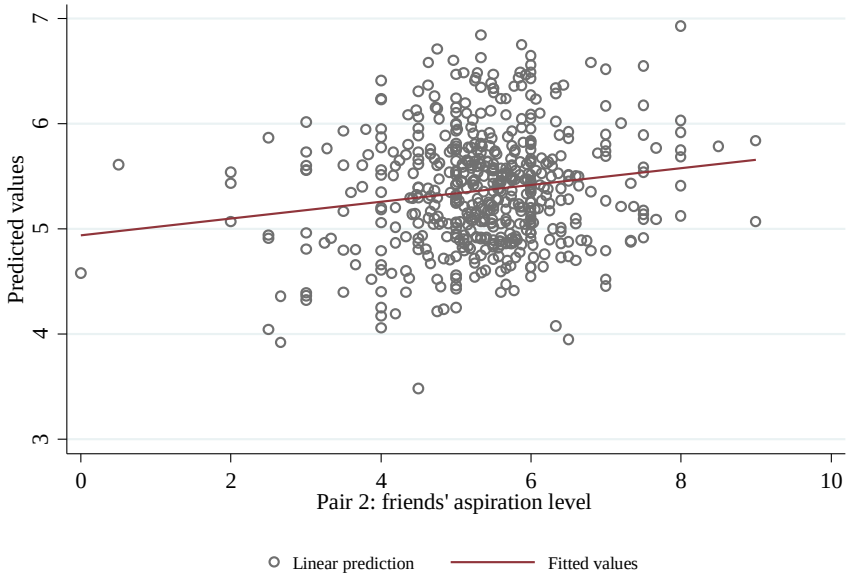
	Pair 1	**Pair 2**	**Pair 3**
Dep var = aspiration level friends	Economic independence – peaceful relations relatives	Economic independence – proximity family/friends	Economic independence – community engagement
	(1)	(2)	(3)
Instruments (characteristics of non-overlapping peers)			
Girl	-0.138	-0.746**	-0.319
	(0.413)	(0.357)	(0.362)
Wealth index (PCA)	-0.286***	-0.349*	-0.300*
	(0.090)	(0.190)	(0.154)
Gisu tribe	0.091	-0.318	-0.485
	(0.658)	(0.389)	(0.474)
Birth order	0.090	0.162*	0.194
	(0.064)	(0.089)	(0.136)
Age	-0.232	-0.309	-0.293
	(0.220)	(0.222)	(0.233)
Partner	0.112	0.191	0.999***
	(0.386)	(0.435)	(0.292)
Locus of control (PCA)	0.095	-0.512**	-0.068
	(0.187)	(0.207)	(0.283)
Live with both parents	0.669	0.316	0.642
	(0.445)	(0.551)	(0.501)
Characteristics of ego			
Girl	-0.254	-0.285	-0.448*
	(0.319)	(0.326)	(0.269)
Wealth index (PCA)	0.098	-0.107	0.028
	(0.066)	(0.087)	(0.096)
Gisu tribe	-0.365	0.055	-0.671*
	(0.377)	(0.380)	(0.382)
Birth order	-0.012	0.091	-0.006
	(0.045)	(0.064)	(0.048)
Age	-0.224*	-0.072	-0.161**
	(0.130)	(0.070)	(0.074)
Partner	0.270	0.685	0.503
	(0.347)	(0.418)	(0.397)
Locus of control (PCA)	-0.020	-0.296*	-0.171
	(0.146)	(0.156)	(0.141)

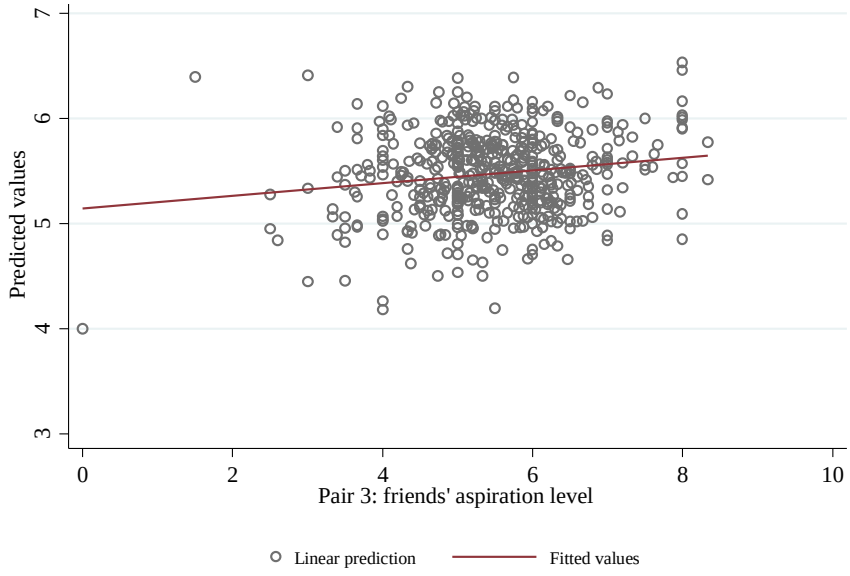
Live with both parents	0.058	0.030	0.331
	(0.367)	(0.410)	(0.540)
Contextual effects (characteristics of friends)			
Girl	0.000	-0.158	0.015
	(0.079)	(0.102)	(0.074)
Wealth index (PCA)	-0.004	-0.019	0.015
	(0.022)	(0.027)	(0.023)
Gisu tribe	0.033	-0.086	-0.045
	(0.102)	(0.102)	(0.063)
Birth order	0.019*	-0.012	-0.027*
	(0.010)	(0.012)	(0.015)
Age	-0.004	-0.036	0.007
	(0.026)	(0.032)	(0.026)
Partner	-0.058	0.040	-0.061
	(0.086)	(0.100)	(0.078)
Locus of control (PCA)	0.011	-0.026	0.004
	(0.042)	(0.036)	(0.031)
Live with both parents	0.669	0.316	0.642
	(0.445)	(0.551)	(0.501)
Constant	13.712***	12.860***	13.641***
	(5.166)	(4.786)	(5.108)
R^2 within	0.094	0.120	0.117
Observations	538	538	538

Notes. * p<0.1, ** p<.05, *** p<0.01. Bootstrap clustered standard errors at the class-level and in parentheses. Class-level fixed effects used. The coefficients reported relate to the first aspiration mentioned per pair. For the second-mentioned aspiration in the pair, the results are exactly the opposite.

Appendix B.4. Scatterplots first-stage predicted values and endogenous regressor







Appendix B.5. Determinants of aspirations (OLS)

	Pair 1			Pair 2			Pair 3		
Dep var = aspiration level ego	Economic independence – peaceful relations with relatives			Economic independence – proximity family/friends			Economic independence – community engagement		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Aspiration level friends	0.170	0.110	0.022	0.109	0.087	-0.007	0.297***	0.297***	0.184*
	(0.122)	(0.114)	(0.130)	(0.082)	(0.086)	(0.097)	(0.083)	(0.093)	(0.103)
Girl		0.201	0.183		0.028	-0.020		-0.635***	-0.601***
		(0.190)	(0.187)		(0.157)	(0.155)		(0.233)	(0.219)
Household wealth index (PCA)		0.050	0.043		-0.046	-0.061*		-0.006	-0.011
		(0.034)	(0.038)		(0.033)	(0.037)		(0.042)	(0.037)
Gisu tribe		-0.106	-0.049		0.337**	0.336**		-0.152	-0.149
		(0.225)	(0.224)		(0.155)	(0.163)		(0.221)	(0.217)
Birth order		0.015	0.017		0.084**	0.083***		-0.010	-0.012
		(0.023)	(0.023)		(0.033)	(0.031)		(0.054)	(0.055)
Age		0.049	0.048		0.083*	0.075		-0.018	-0.009
		(0.058)	(0.055)		(0.048)	(0.049)		(0.039)	(0.037)
Partner		0.211*	0.205		0.448**	0.463**		0.502**	0.497**
		(0.122)	(0.131)		(0.223)	(0.226)		(0.221)	(0.227)
Locus of control (PCA)		0.054	0.065		-0.030	-0.019		0.057	0.049
		(0.065)	(0.067)		(0.087)	(0.093)		(0.062)	(0.064)
Live with both parents		-0.117	-0.066		0.021	0.005		0.318	0.357*
		(0.186)	(0.194)		(0.219)	(0.215)		(0.195)	(0.210)
Constant	4.245***	1.118	1.594	4.706***	2.496	4.013	3.860***	3.037	2.655
	(0.679)	(3.129)	(2.999)	(0.402)	(3.792)	(4.011)	(0.404)	(3.921)	(3.914)
Contextual effects (characteristics friends)	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Class-level fixed effect	No	No	Yes	No	No	Yes	No	No	Yes
Adjusted R^2	0.005	0.002	-0.018	0.001	0.021	0.017	0.019	0.029	0.014
Observations	538	538	538	538	538	538	538	538	538

Notes. * p<0.1, ** p<.05, *** p<0.01. OLS regressions. Bootstrap clustered standard errors at the class-level in parentheses. The coefficients reported relate to the first aspiration mentioned per pair. For the second-mentioned aspiration in the pair, the results are exactly the opposite. The contextual effects include the full set of characteristics of friends.

Appendix B.6. IV/2SLS and IV/GMM with and without class-level FEs

	Pair 1				Pair 2				Pair 3			
Dep var = aspiration level ego	Economic independence – peaceful relations with relatives				Economic independence – proximity family/friends				Economic independence – community engagement			
	2SLS		GMM-2s		2SLS		GMM-2s		2SLS		GMM-2s	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Aspiration level friends	1.419***	0.770	1.018**	0.760	1.185***	0.765**	0.949***	0.699**	0.712**	1.061**	0.425	0.988***
	(0.484)	(0.665)	(0.438)	(0.555)	(0.383)	(0.385)	(0.311)	(0.319)	(0.332)	(0.469)	(0.336)	(0.350)
Class-level fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
K-P Wald F statistic	1.708	7.697	1.708	7.697	4.246	33.426	4.246	33.426	3.838	15.442	3.838	15.442
Sargan-Hansen J statistic [37]	7.781	10.313	7.781	10.313	3.753	5.484	3.753	5.484	3.332	7.442	3.332	7.442
Endogeneity test	1.372	0.490	1.372	0.490	6.111**	4.237**	6.111**	4.237**	1.065	4.416**	1.065	4.416**
Observations	538	538	538	538	538	538	538	538	538	538	538	538

Notes. * p<0.1, ** p<.05, *** p<0.01. Bootstrapped standard errors at the class-level in parentheses. Class-level fixed effects used. Each regression controls for ego's own characteristics and friends' characteristics. Excluded instruments: 1) gender friends' friends, 2) birth order friends' friends, 3) household wealth friends' friends, 4) partner friends' friends, 5) locus of control friends' friends, 6) age friends' friends, 7) living with both parents friends' friends, and 8) Gisu tribe friends' friends.

[37] To obtain statistics on the overidentification test for all instruments we use the Frisch-Waugh-Lovell Theorem and partial out the characteristics of the individual and contextual effects as exogenous regressors (Baum et al., 2007).

Appendices for Chapter 4

Appendix C.1. Example of a table used for the real-effort task

Table 1

NAME PARTICIPANT:									
NUMBER OF ZEROS:									
1	1	1	1	1	0	0	1	1	0
0	1	0	1	1	1	0	0	0	0
0	1	1	0	0	1	1	1	0	1
0	0	1	0	1	1	0	0	1	0
1	0	0	0	1	0	0	0	1	0
0	1	1	1	0	1	1	0	1	0
0	0	1	0	1	1	1	0	1	1
0	1	0	0	0	0	0	1	1	0
1	0	1	1	1	1	1	0	1	1
0	1	0	0	1	0	0	0	1	0
0	0	0	1	0	0	1	1	1	1

Appendix C.2. Sampling roster

Treatment 1 (control)	**Treatment 2**	**Treatment 3**	**Treatment 4**	Participants cumulative
		Mbale district		
Mbale School 1	Mbale School 1	Mbale School 1	Mbale School 1	16
Mbale School 1	Mbale School 2	Mbale School 2	Mbale School 2	32
Mbale School 2	Mbale School 2	Mbale School 2	Mbale School 2	48
Mbale School 3	Mbale School 3	Mbale School 3	Mbale School 3	64
Mbale School 3	Mbale School 3	Mbale School 3	Mbale School 3	80
Mbale School 3	Mbale School 4	Mbale School 4	Mbale School 4	96
Mbale School 4	Mbale School 4	Mbale School 4	Mbale School 4	112
Mbale School 5	Mbale School 5	Mbale School 5	Mbale School 5	128
Mbale School 5	Mbale School 5	Mbale School 5	Mbale School 5	144
Mbale School 5	Mbale School 5	Mbale School 5	Mbale School 5	160
Mbale School 5				164
		Sironko district		
Sironko School 1 (class 1)	Sironko School 1 (class 1)	Sironko School 1 (class 1)	Sironko School 1 (class 1)	180
Sironko School 1 (class 2)	Sironko School 1 (class 2)	Sironko School 1 (class 2)	Sironko School 1 (class 2)	196
Sironko School 1 (class 2)	Sironko School 2	Sironko School 2	Sironko School 2	212
Sironko School 2	Sironko School 2	Sironko School 3 (class 1)	Sironko School 3 (class 1)	228
Sironko School 3 (class 1)	Sironko School 3 (class 1)	Sironko School 3 (class 1)	Sironko School 3 (class 1)	244
Sironko School 3 (class 1)	Sironko School 3 (class 1)	Sironko School 3 (class 1)	Sironko School 3 (class 1)	260
Sironko School 3 (class 2)	Sironko School 3 (class 2)	Sironko School 3 (class 2)	Sironko School 3 (class 2)	276

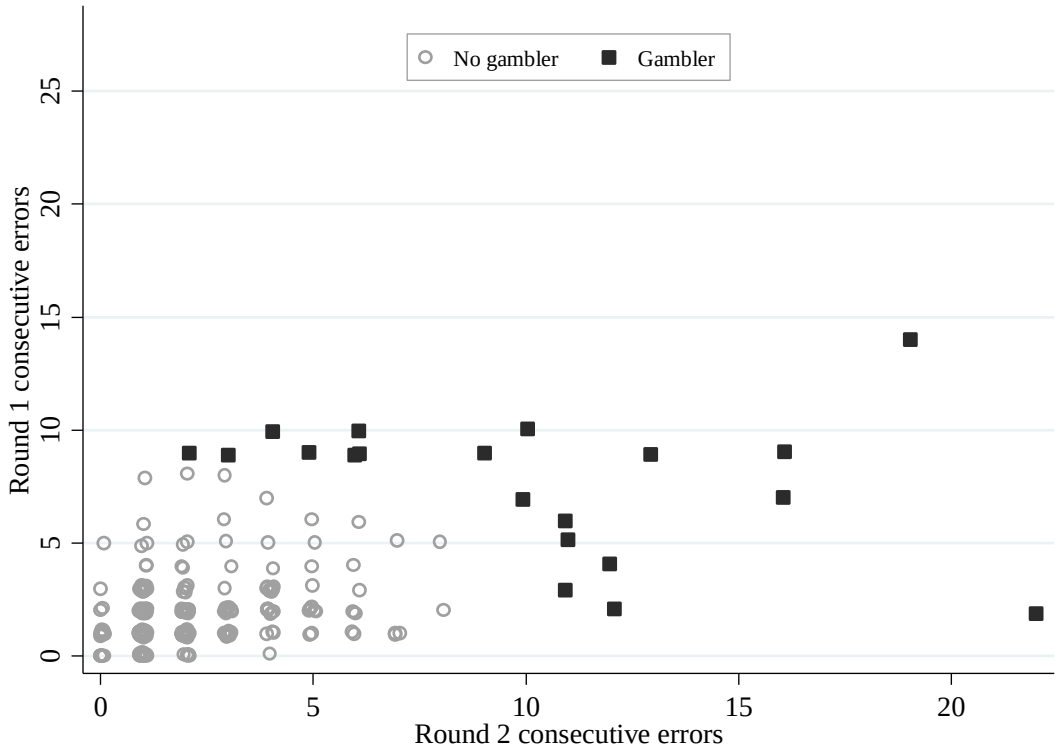
Note: Each entry represents a group of four students.

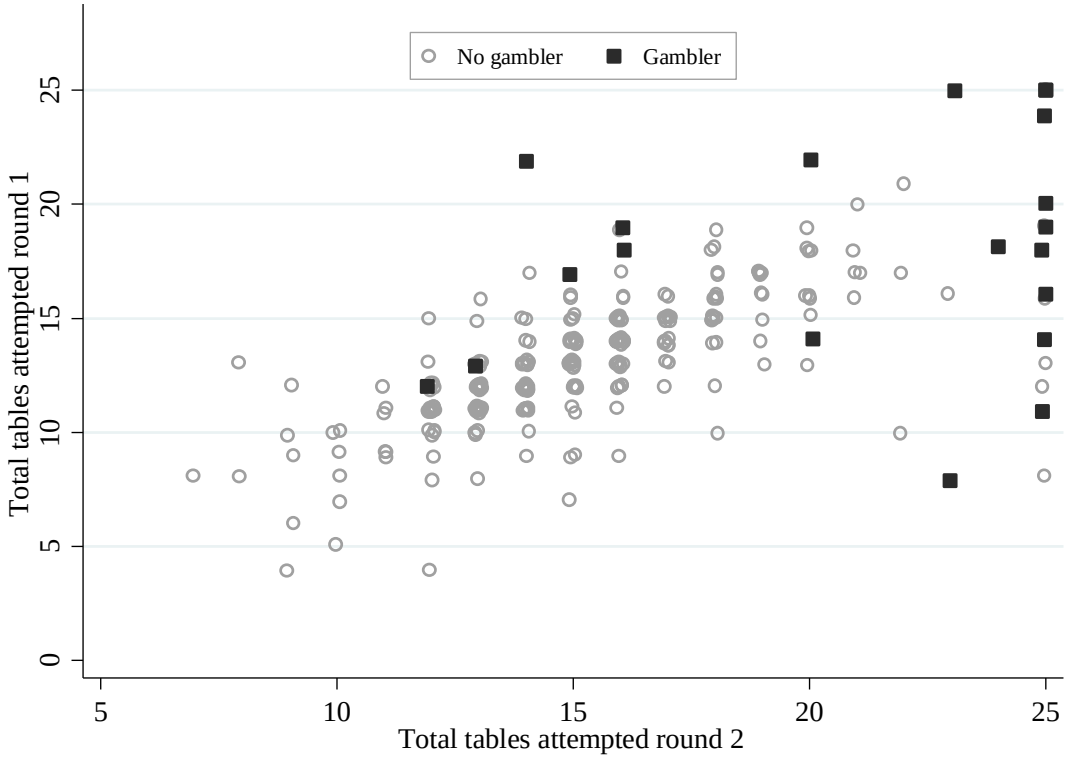
Appendix C.3. Determinants of participating in the real-effort experiment

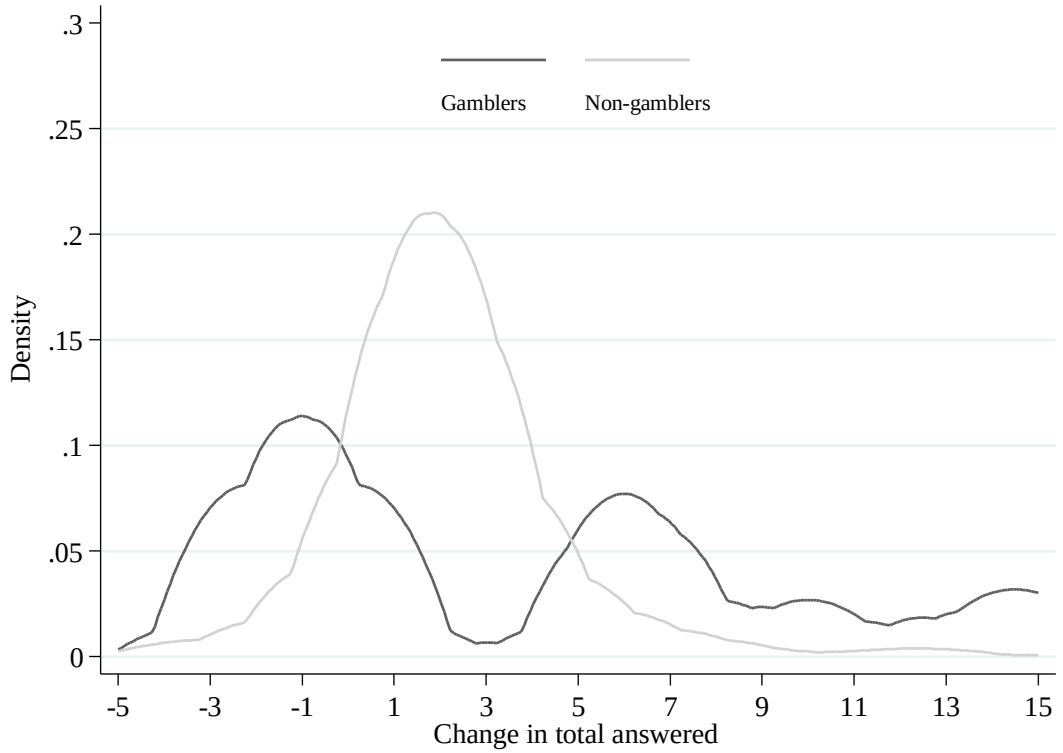
Dep var = participation experiment	**Logistic regression**	**OLS regression**
	(1)	(2)
Girl	0.199	0.026
	(0.423)	(0.056)
Household wealth index (PCA)	-0.065	-0.009
	(0.067)	(0.008)
Gisu tribe	-0.882**	-0.091**
	(0.365)	(0.038)
Total number of siblings	0.010	0.002
	(0.039)	(0.004)
Firstborn	-0.923**	-0.124**
	(0.372)	(0.052)
Father enrolled in secondary education or higher	0.044	0.011
	(0.353)	(0.038)
Mother enrolled in secondary education or higher	0.292	0.032
	(0.498)	(0.058)
Household dependency ratio	-0.245	-0.033
	(0.256)	(0.034)
Constant		0.920***
		(0.038)
Observations	332	332
Class-level fixed effects	Yes	Yes

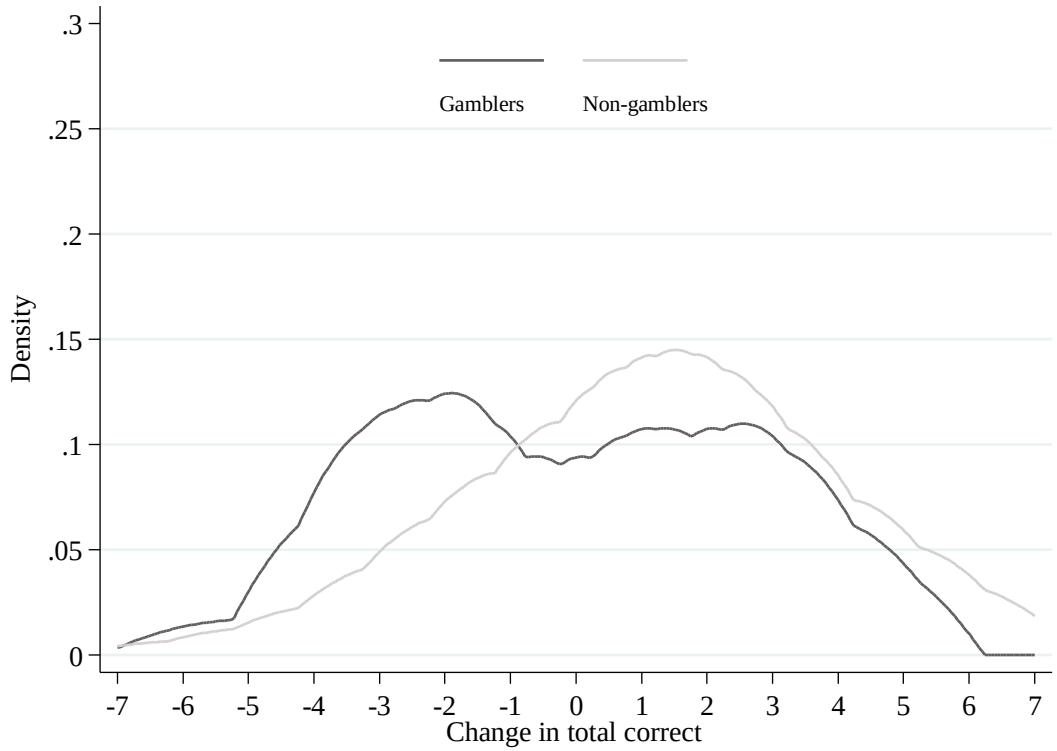
Notes. * p<0.1, ** p<.05, *** p<0.01. Bootstrapped standard errors at the class-level in parentheses. Class-level fixed effects used.

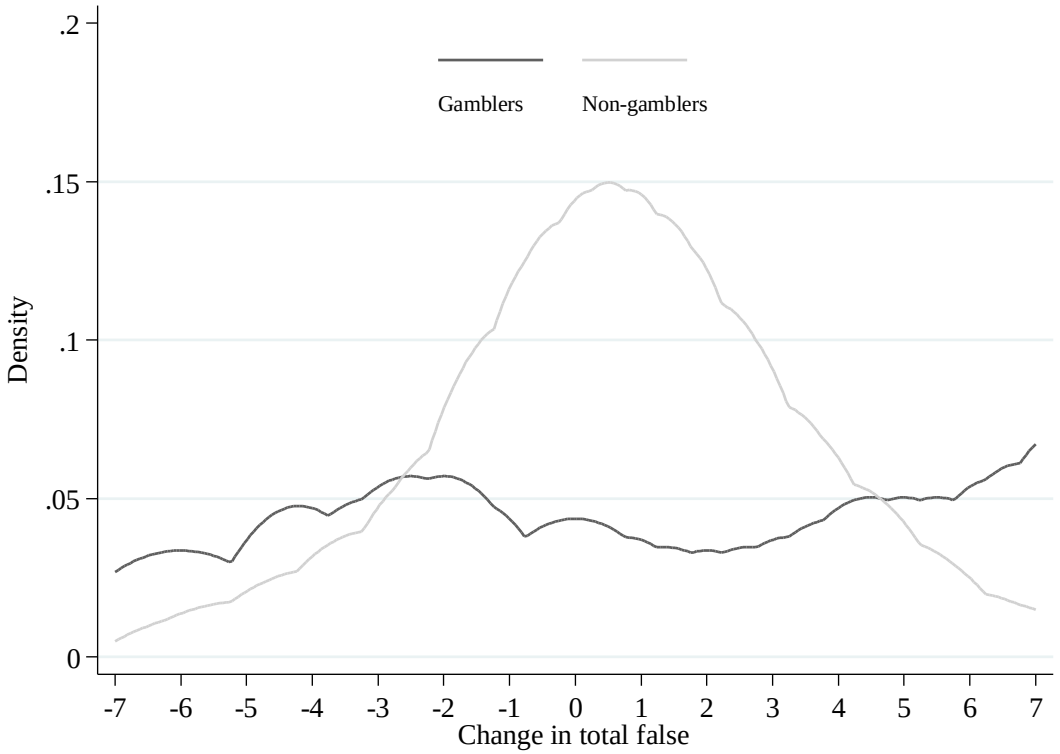
Appendix C.4. Scatter and kernel density plots identifying gamblers

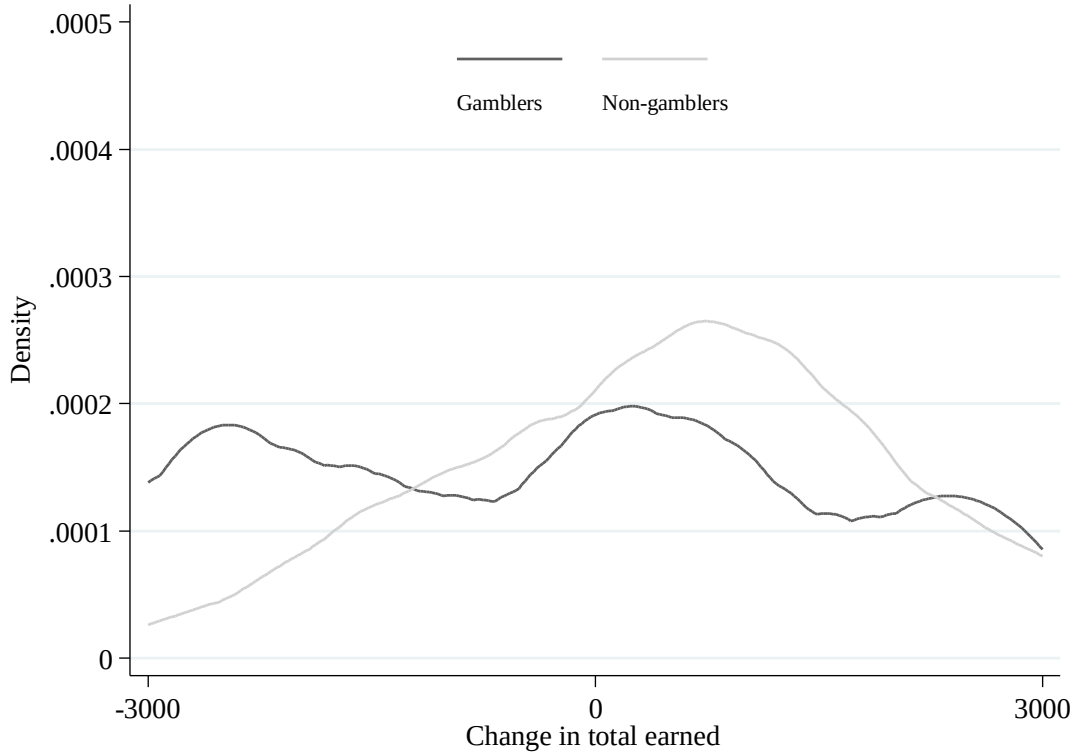


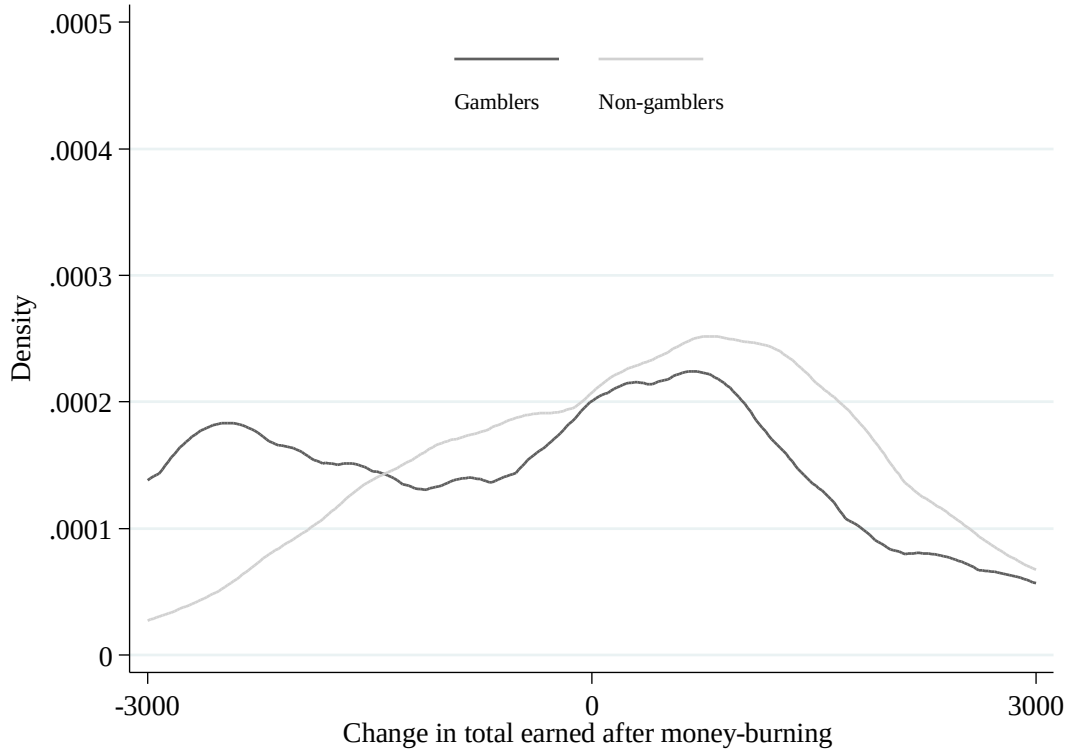



Gamblers
Non-gamblers
Density
.3
.25
.2
.15
.1
.05
0
-5
-3
-1
1
3
5
7
9
11
13
15
Change in total answered

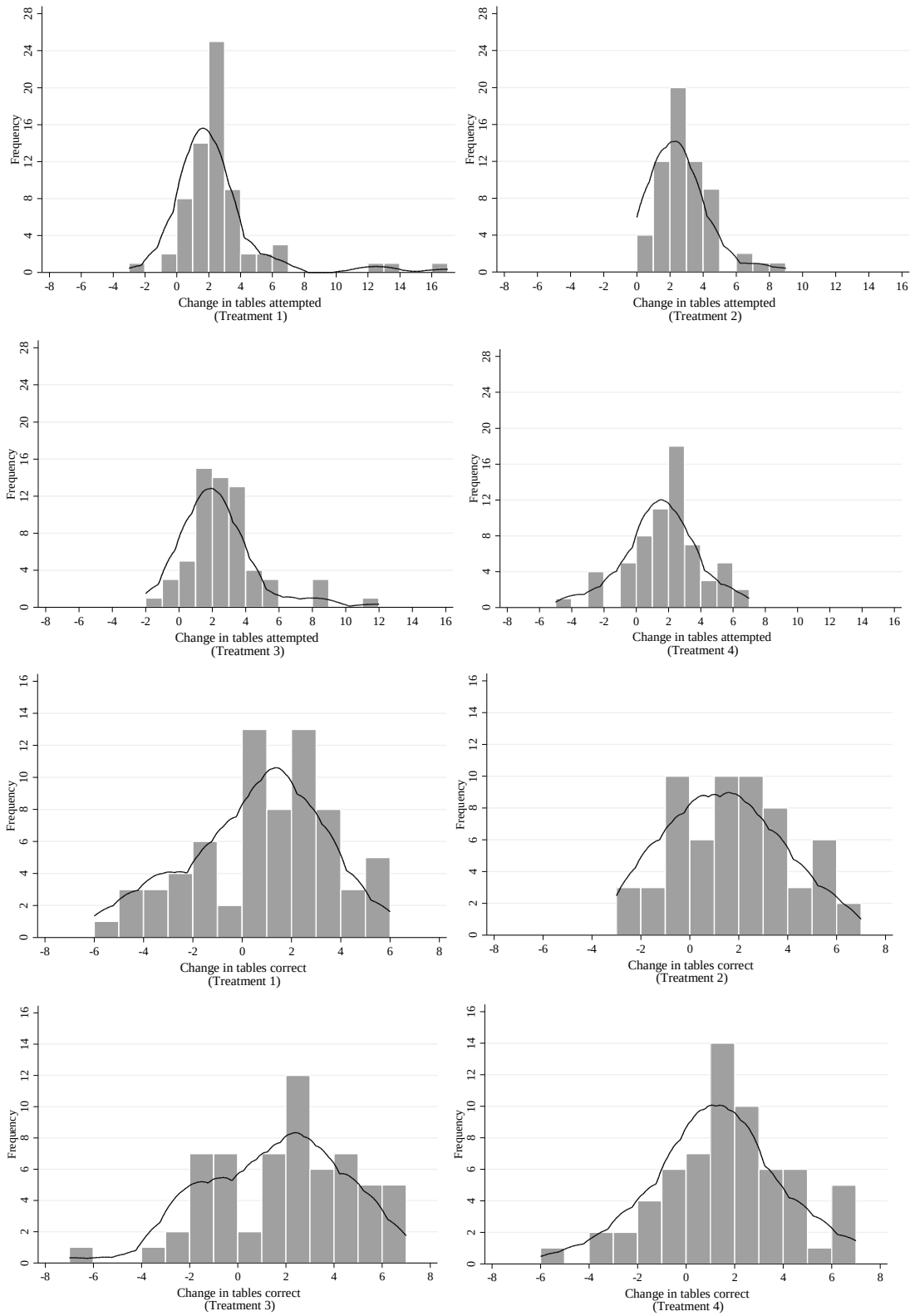

Gamblers
Non-gamblers
Density
.3
.25
.2
.15
.1
.05
0
-7
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
7
Change in total correct

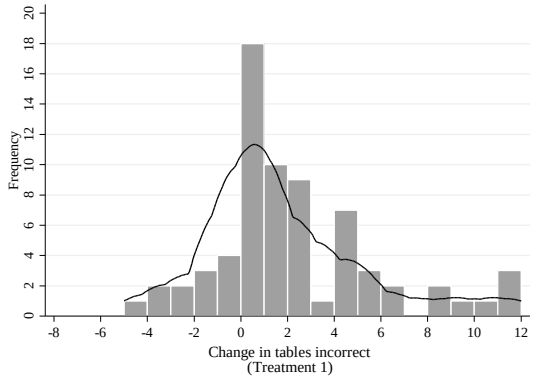

.2
.15
.1
.05
0
Density
Gamblers
Non-gamblers
-7
-6
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
7
Change in total false

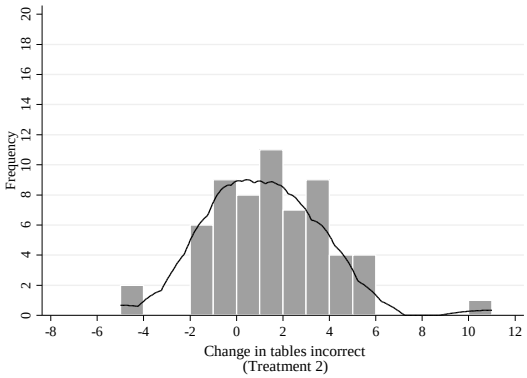

.0005
.0004
.0003
.0002
.0001
0
Density
Gamblers
Non-gamblers
-3000
0
3000
Change in total earned


.0005
.0004
.0003
.0002
.0001
0
Density
Gamblers
Non-gamblers
-3000
0
3000
Change in total earned after money-burning

Appendix C.5. Histograms with kernel density estimates of effort by round and treatment




Frequency
0 2 4 6 8 10 12 14 16 18 20
-8 -6 -4 -2 0 2 4 6 8 10 12
Change in tables incorrect
(Treatment 1)


Frequency
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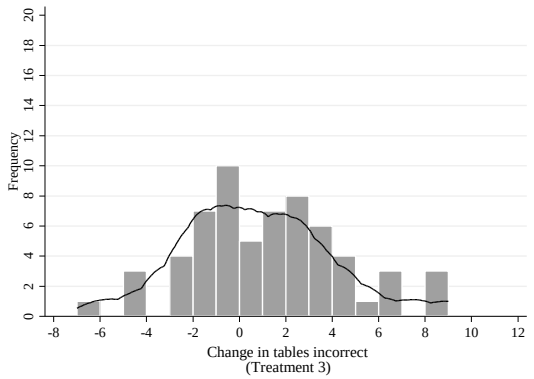
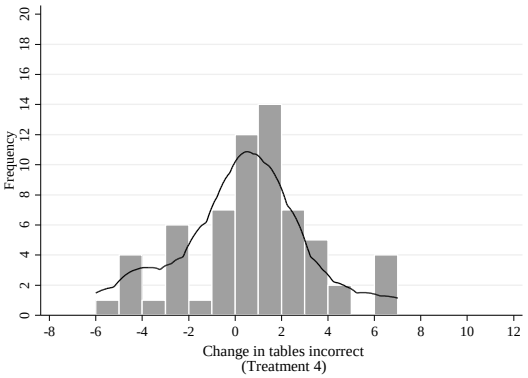
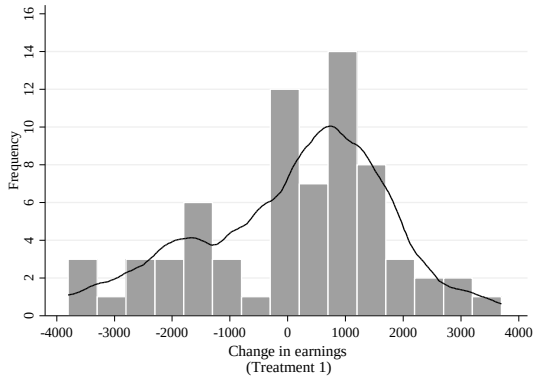
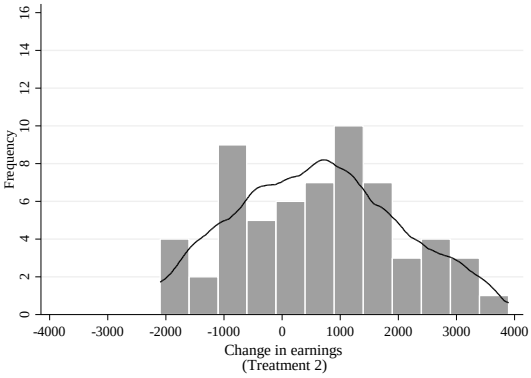
-8 -6 -4 -2 0 2 4 6 8 10 12
Change in tables incorrect
(Treatment 2)


Frequency
0 2 4 6 8 10 12 14 16 18 20
-8 -6 -4 -2 0 2 4 6 8 10 12
Change in tables incorrect
(Treatment 3)


Frequency
0 2 4 6 8 10 12 14 16 18 20
-8 -6 -4 -2 0 2 4 6 8 10 12
Change in tables incorrect
(Treatment 4)


Frequency
0 2 4 6 8 10 12 14 16
-4000 -3000 -2000 -1000 0 1000 2000 3000 4000
Change in earnings
(Treatment 1)


Frequency
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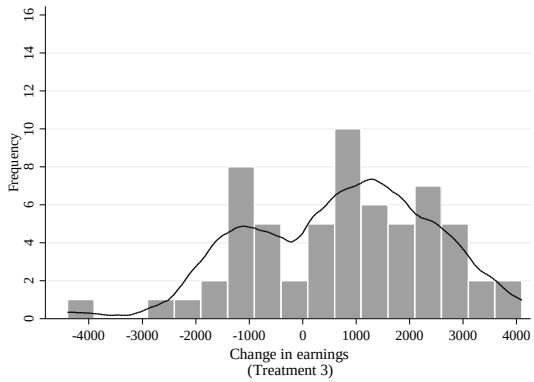
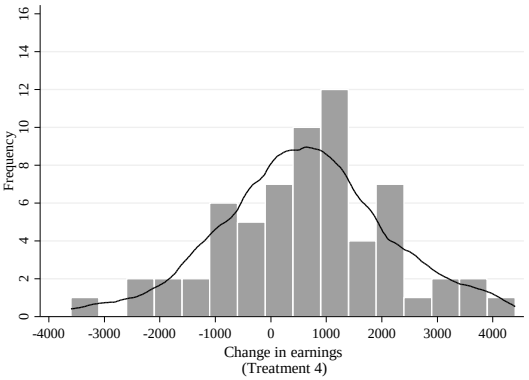
-4000 -3000 -2000 -1000 0 1000 2000 3000 4000
Change in earnings
(Treatment 2)


Frequency
0 2 4 6 8 10 12 14 16
-4000 -3000 -2000 -1000 0 1000 2000 3000 4000
Change in earnings
(Treatment 3)


Frequency
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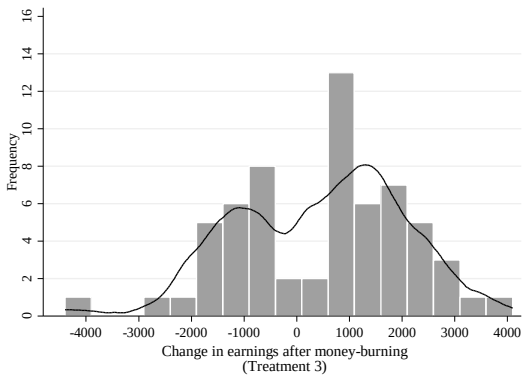
-4000 -3000 -2000 -1000 0 1000 2000 3000 4000
Change in earnings
(Treatment 4)


Frequency
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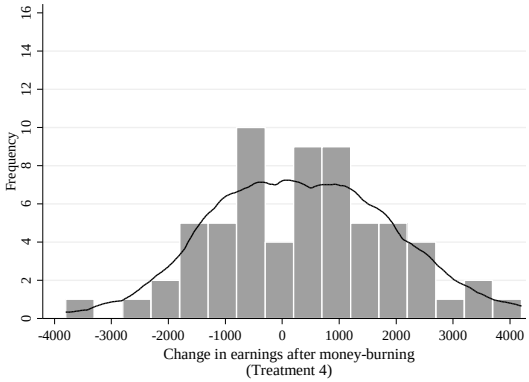
2
4
6
8
10
12
14
16
-4000
-3000
-2000
-1000
0
1000
2000
3000
4000
Change in earnings after money-burning
(Treatment 3)

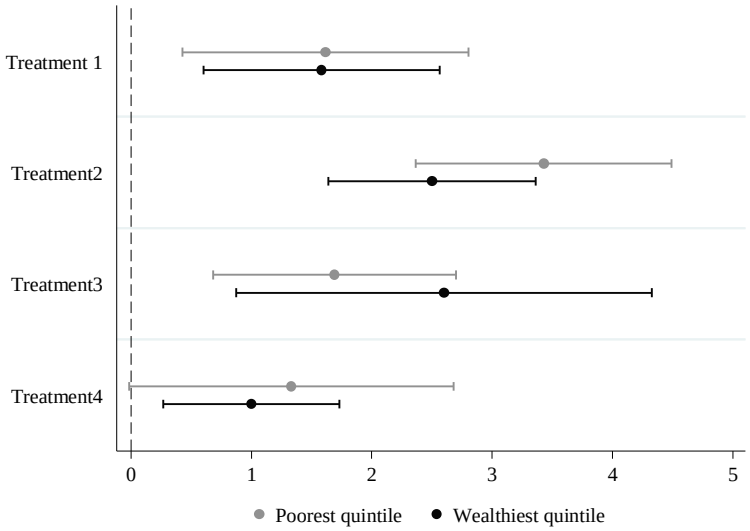

Frequency
0
2
4
6
8
10
12
14
16
-4000
-3000
-2000
-1000
0
1000
2000
3000
4000
Change in earnings after money-burning
(Treatment 4)

Appendix C.6. Heterogeneous treatment effects; poorest students vs wealthiest students

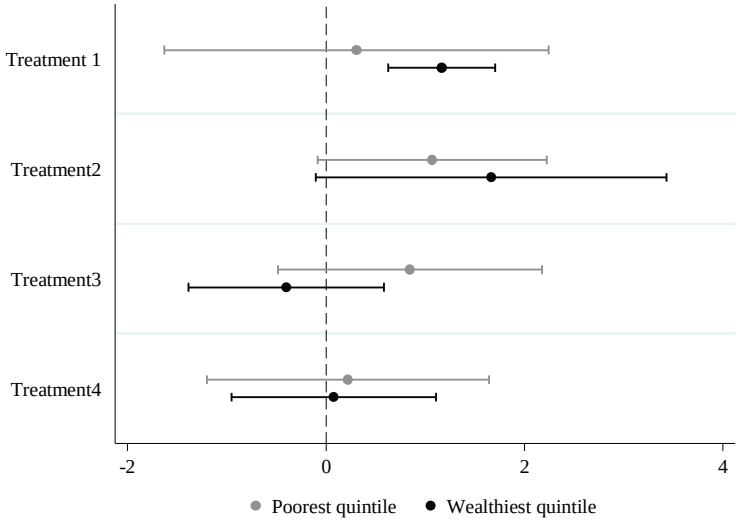
Wealth index: pooled sample with only participants belonging to 1st and 5th wealth quintile					
	Attempted	Correct	Incorrect	Earnings	Earnings after money-burning
	(1)	(2)	(3)	(4)	(5)
Treatment 1 (round 2 = round 1)	1.615***	0.308	1.308*	23.077	23.077
	(0.594)	(1.001)	(0.753)	(563.151)	(563.151)
Treatment 2 (feedback)	3.429***	1.071*	2.357***	300.000	300.000
	(0.496)	(0.567)	(0.880)	(361.587)	(361.587)
Treatment 3 (money-burning)	1.692***	0.846	0.846	338.462	330.000
	(0.520)	(0.679)	(0.993)	(429.088)	(432.563)
Treatment 4 (money-burning and feedback)	1.333**	0.222	1.111	-0.000	-577.778*
	(0.657)	(0.706)	(0.815)	(409.431)	(317.433)
Treatment 1 (round 2 = round 1) * wealthiest	-0.032	0.859	-0.891	518.590	518.590
	(0.858)	(1.083)	(0.940)	(606.922)	(606.922)
Treatment 2 (feedback) * wealthiest	-0.929	0.595	-1.524	450.000	450.000
	(0.696)	(1.054)	(1.307)	(641.397)	(641.397)
Treatment 3 (money-burning) * wealthiest	0.908	-1.246	2.154*	-838.462*	-940.000*
	(1.162)	(0.865)	(1.213)	(495.404)	(528.315)
Treatment 4 (money-burning and feedback) * wealthiest	-0.333	-0.145	-0.188	-53.846	216.239
	(0.852)	(0.912)	(1.219)	(549.894)	(467.244)
Constant	13.000***	9.906***	3.094***	4643.750***	4643.750***
	(0.231)	(0.253)	(0.176)	(135.882)	(135.882)
R^2 within	0.548	0.075	0.205	0.028	0.051
Observations	192	192	192	192	192

Notes. * p<0.10, ** p<0.05, *** p<.01. Individual fixed effects regression. Bootstrapped standard errors clustered at the school level and in parentheses. The poorest quintile is the base category. Earnings are in UGX.

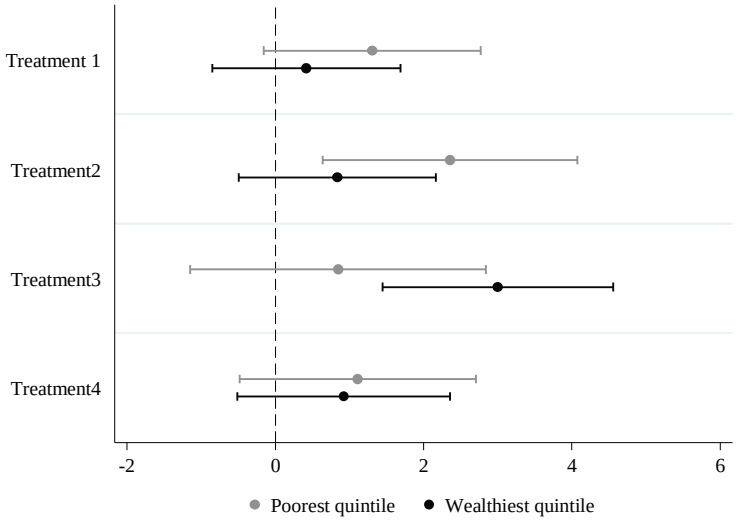
Coefficient plot 1: change in tables attempted



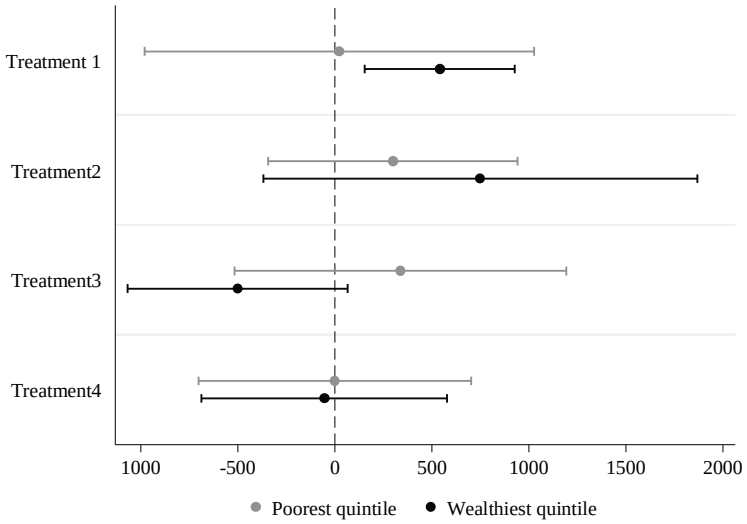
Coefficient plot 2: change in correct answers



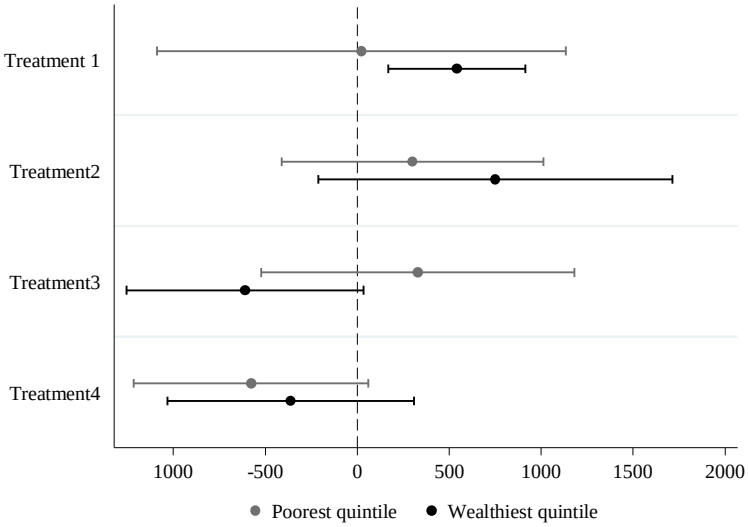
Coefficient plot 3: change in incorrect answers



Coefficient plot 4: change in earnings



Coefficient plot 5: change in earnings after money-burning



Appendix C.7. Heterogeneous treatment effects; wealth subsample vs remaining sample

	Wealth index 1st quintile					Wealth index 5th quintile				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Attempted	Correct	Incorrect	Earnings	Earnings after money-burning	Attempted	Correct	Incorrect	Earnings	Earnings after money-burning
T1: round 2 = round 1	2.554***	0.589	1.964***	98.214	98.214	2.544***	0.404	2.140***	-12.281	-12.281
	(0.474)	(0.365)	(0.523)	(209.858)	(212.709)	(0.485)	(0.513)	(0.579)	(302.703)	(295.532)
T2: feedback	2.213***	1.468***	0.745***	659.574***	659.574***	2.490***	1.306***	1.184***	534.694***	534.694***
	(0.203)	(0.341)	(0.250)	(193.233)	(191.316)	(0.179)	(0.242)	(0.201)	(133.952)	(135.627)
T3: money-burning	2.490***	1.714***	0.776	779.592**	440.816	2.269***	1.904***	0.365	915.385***	615.192**
	(0.331)	(0.574)	(0.632)	(339.713)	(326.702)	(0.442)	(0.483)	(0.551)	(281.662)	(249.196)
T4: money-burning & feedback	1.545***	1.382**	0.164	674.545*	474.545	1.647***	1.510***	0.137	741.176**	501.961*
	(0.296)	(0.616)	(0.431)	(350.275)	(305.395)	(0.295)	(0.586)	(0.531)	(349.299)	(269.226)
T1: round 2 = round 1 * wealth	-0.938	-0.282	-0.657	-75.137	-75.137	-0.961	0.763	-1.724**	553.947*	553.947*
	(0.778)	(0.939)	(1.011)	(549.961)	(543.839)	(0.807)	(0.568)	(0.874)	(336.555)	(331.867)
T2: feedback * wealth	1.216**	-0.397	1.612	-359.574	-359.574	0.010	0.361	-0.350	215.306	215.306
	(0.519)	(0.708)	(1.038)	(454.268)	(448.798)	(0.399)	(0.863)	(0.792)	(513.379)	(502.949)
T3: money-burning * wealth	-0.797*	-0.868	0.071	-441.130	-110.816	0.331	-2.304***	2.635***	-1415.385***	-1225.192***
	(0.439)	(0.868)	(1.093)	(522.121)	(556.761)	(1.176)	(0.663)	(0.929)	(347.358)	(341.003)
T4: money-burning & feedback	-0.212	-1.160	0.947	-674.545*	-1052.323***	-0.647	-1.433*	0.786	-795.023*	-863.499*
* wealth	(0.757)	(0.715)	(0.681)	(389.710)	(370.373)	(0.516)	(0.755)	(1.034)	(476.683)	(458.142)
Constant	13.055***	9.895***	3.160***	4631.250***	4631.250***	13.055***	9.895***	3.160***	4631.250***	4631.250***
	(0.208)	(0.182)	(0.143)	(93.568)	(94.983)	(0.211)	(0.183)	(0.144)	(94.484)	(95.048)
R^2 within	0.467	0.169	0.125	0.100	0.060	0.460	0.194	0.145	0.129	0.082
Observations	512	512	512	512	512	512	512	512	512	512

Notes. * p<0.10, ** p<0.05, *** p<.01. Individual fixed effects regression. Bootstrapped standard errors clustered at the school level and in parentheses. The pooled sample excluding the poorest quintile (in columns 1 to 4) and the richest quintile (in columns 5 to 8) is the base category. The treatment coefficients represent the change in effort between round 2 and round 1. Earnings are in UGX.