Age Set vs. Kin: Culture and Financial Ties in East Africa*

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August 31, 2022

Abstract

We study how social organization shapes patterns of economic interaction and the effects of national policy, focusing on the distinction between age-based and kin-based groups in sub-Saharan Africa. Motivated by ethnographic accounts suggesting that this distinction affects redistribution, we analyze a cash transfer program in Kenya and find that in age-based societies there are consumption spillovers within the age cohort, but not the extended family, while in kin-based societies we find the opposite. Next, we document that social structure shapes the impact of policy by showing that Uganda's pension program had positive effects on child nutrition only in kin-based societies.

*We thank Daron Acemoglu, Alberto Alesina, Isaiah Andrews, David Atkin, Augustin Bergeron, Pedro Bessone Tepedino, Emily Breza, Melissa Dell, Esther Duflo, Eliana La Ferrara, Isadora Frankenthal, Rema Hanna, Michael Kremer, Sara Lowes, Elisa Macchi, Stelios Michalopoulos, Nathan Nunn, Ben Olken, Elias Papaioannou, Gautam Rao, James A. Robinson, and Robert M. Townsend for advice and comments. We are grateful to Carla Handley for sharing her field notes and interviews with us, and to Amrik Heyer and her team for sharing her knowledge on cash transfers in Kenya. We also thank seminar participants at Harvard, MIT, DEVPEC, the NEUDC, the Young Economists Symposium, the Sadie Collective, the CEPR Worksop in Development Economics, Frontiers of Development Symposium, LEAP Bocconi, the BREAD Development Conference at Northwestern, the Brown Conference on the Roots of Comparative Development, and the African Meeting of the Econometric Society for their suggestions. Natalia Bard, Lena Chen, Romaine Loubes, and Astrud Ouyang provided excellent research assistance.

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I. Introduction

Informal income transfers are pervasive in low-income contexts. They influence people's everyday lives, making it possible to ward off periodic hardship, and the pattern and scale of these transfers shape the impact of public policy. In economic analysis, families or villages are the social units in which informal economic interactions are typically assumed to take place and in which individuals form financial links in order to smooth consumption in response to changing economic conditions (e.g. Townsend, 1994, 1995).[1] Anthropologists since Boas (1887) and Lowie (1917), however, have documented vast and persistent differences in the pattern of social and economic exchange across cultures, and argue that even seemingly clear-cut social groupings like the family vary widely in relevance. These differences in the dominant social organization lead to widespread variation in traditional patterns of allegiance, which persist and do not always adapt to changing individual or regional economic conditions. In this framework, the relative importance of different social structures—including those outside the family—determines the pattern and strength of financial ties and, as a result, may shape the spillover effects of development policy.

This paper empirically investigates the extent to which long-standing features of social organization shape present-day financial ties and predict the distributional effects of public policy. Our focus is the stark distinction between societies organized around kin-based social groups and societies organized around age-based social groups. In kin based societies, the main social group is the extended family and it is within the kin group that social allegience and financial ties are often strongest (La Ferrara, 2007; Alesina and Giuliano, 2010, 2014; Kinnan and Townsend, 2012; Lowes, 2018a; Bau, 2021). In age-based societies (or "age set" societies), however, the primary social unit is the age set, a group of individuals who are of similar age and initiated into adulthood at the same time, and the strongest feelings of obligation are between individuals of the same age set. While uncommon in the West, age set organization exists around the world and is particularly prevalent in Africa, where we estimate over 200 million people live ethnic groups in which age sets are the traditionally dominant form of social organization.[2] As a result, age set organization is described by Lowie (1921) as the "most important example of an alternative to kinship-based organization." Nevertheless, the impact of age based organization on economic activity remains largely unknown.

Age set organization has been thoroughly studied by anthropologists and their qualitative accounts suggest that in age set societies, within-cohort economic ties are substantially stronger than within-family and inter-generational ties (e.g. Radcliffe-Brown, 1929; Dyson-Hudson, 1963). According to Eisenstadt (1954): "[R]elations between age mates [involve] general and permanent obligations of cooperation, solidarity, [and] help, closely resembling, in this respect, the family and kinship." Still today, in age set societies in Kenya it is "toward age mates that men look for support rather than brothers or close patrilineal kin" (Spencer, 2014). Age mates are initiated together at a young age

[1] There is also a growing realization of the value of direct network measurement for understanding financial transfers and analyzing policy (see Breza et al., 2019, for a review); many contexts pose limits on such detailed data collection, however, leaving us with a limited understanding of global variation in the structure of financial ties.

[2] Appendix A.6 describes the construction of our population estimate, which we compute by linking an extensive set of ethnographic accounts of social structure with modern ethnicity-level population data. Outside of Africa, age set organization has been studied in Brazil (e.g. Welch, 2010) and the Pacific Islands (e.g. Claessen et al., 1978).

and pass through each phase of life together, creating a strong and life-long bond. Across studied examples, age sets lead to a strikingly different structure of allegiance and pattern of economic ties, even compared to kin-based groups living in the same country or region (Morton, 1979).

We provide direct evidence of the impact of age-based vs. kin-based organization on the strength of financial ties, focusing on East Africa, a setting in which these two prominent forms of social organization exist in the same areas. Our main hypothesis is that age set organization encourages stronger within-cohort links and weaker within-family and inter-generational links. This distinction leads to markedly different, yet predictable, spillover effects of public policy since resources are more likely to be distributed within the age cohort but less likely to be distributed within the kin group or across generations within the family. In order to investigate these hypotheses, we compile data on the social structure of ethnic groups in Kenya and Uganda, the focus of our analysis. Information on the presence of age set organization is not available from standard ethnographic databases, including Murdock (1967)'s *Ethnographic Atlas*. Therefore, we use a wide range of sources to determine whether the dominant social form of each society is the age set or kin group (see Appendix A.1).[3]

The first part of our empirical analysis homes in on a cash transfer experiment in Kenya in order to directly investigate how exogenous income changes are re-distributed in age set societies, compared to kin-based societies. In particular, we study a randomized evaluation of Kenya's Hunger Safety Net Program (HSNP), a large-scale cash transfer program that features both within-sample variation in age set organization and all data collection required to investigate our hypotheses.[4] In the study, which took place across 48 sub-locations in Northern Kenya, households were determined eligible to receive the cash transfers via one of several targeting mechanisms; half of the sub-locations were assigned to the treatment group, where delivery of the transfers began immediately, while half were assigned to the control group, where transfer delivery was delayed by two years.[5] Crucially, members of age-based and kin-based societies are in both the eligible and non-eligible populations, in both treated and control sub-locations.

We first exploit the cash transfer experiment and a triple-difference empirical design to estimate within-cohort consumption spillovers, separately for members of age-based and kin-based societies. Comparing consumption patterns of *transfer-ineligible* households in treatment and control sub-locations, we find that randomly increasing the income of an individual's cohort members increases consumption spending in age set societies and has no effect in kin-based societies. On average, every treated cohort member in an age set society increases consumption spending for members of the spillover group by $23 USD, corresponding to 13% of the size of the transfer itself and 8% of median local income. As a falsification exercise, we document that there are no estimated spillover effects in age set societies from transfers to members of other cohorts in the same village, consistent

[3] We focus on the full set of ethnic groups listed for each country in the latest round of the *Demographic and Health Surveys*. We were able to definitively determine the dominant form of social organization for 99% of the studied sample in Kenya and 85% of the sample in Uganda, where we find members of age set societies comprise 72% and 27% of the population respectively. Section II and Appendix A.1 describe this process in detail.

[4] As will become clear, our analysis requires local variation in age set organization (in both treatment and control groups), as well as information on household-level ethnicity, age composition, and consumption. The HSNP evaluation data are public and available at `https://microdata.worldbank.org`. The original analysis of the program evaluation data was conduced by Merttens et al. (2013).

[5] Sub-locations are super-sets of villages and are a standard and economically important administrative unit in Kenya.

with the effect being driven by age set organization itself.

These initial findings suggest that age set societies have large within-cohort consumption spillovers that are absent in kin-based societies; however, age set ties could be either *in addition to* family ties or, as suggested by ethnographic accounts, *instead of* family ties. The HSNP evaluation did not directly collect data on extended family members or kin networks that could be used to estimate within-family spillover effects; therefore, we use two alternative strategies. First, while we find consumption spillover effects within sub-clans in kin-based societies, we show that these effects are entirely absent in age set societies.[6] Second, to more directly investigate inter-generational ties within the family, we exploit the fact that one of the experiment's treatment arms was designed to simulate a pension program. It is often hypothesized that pension programs benefit children because grandparents invest in their grandchildren (Bertrand et al., 2003; Duflo, 2003). However, if inter-generational ties are weak in age set societies, pension recipients may be less likely to invest in children. Consistent with this conjecture, we find that pension grants led to substantial increases in child weight and educational investment in kin-based societies, while these effects are entirely absent in age set societies.[7]

Together, this first set of findings suggests that variation in social structure generates distinct patterns of financial ties. These differences are predictable using ethnographic descriptions of social organization, suggesting that ethnographic work could be a useful tool for approximating local network structures. Next, we directly investigate how local variation in social structure shapes the impact of national development policy.

The second part of our empirical analysis studies the staggered introduction of Uganda's national Senior Citizen Grant (SCG), a countrywide pension program for individuals over 65, and how variation in social organization affects the consequences of this large-scale policy. The Ugandan government anticipated that the program would have broad positive effects on *children*, which was a key goal of the program. According to the website of Uganda's Ministry of Gender, Labour and Social Development, the agency in charge of the SCG: "Although the SCGs target older people, the grants benefit more than only the senior citizen beneficiaries. [They also] have significant impact on development outcomes as older people tend to invest a portion of their grant money in meeting their *grandchildren's* nutritional, health, and education needs."

To investigate the impact of the SCG on investment in children, we exploit the fact that the SCG was piloted in 2011 in fifteen districts, combined with the fact that both pilot and non-pilot districts contain members of age set and kin-based societies. We use the 2016 round of Uganda's Demographic and Health Survey (DHS) to measure the *potential pension exposure* of each extended household using information on the age distribution of its members, as well as detailed anthropometric information about each child. Using a triple-difference identification strategy analogous to our analysis of the HSNP, we find a large, positive effect of the pension program on several measures of child nutrition in kin-based societies, and no observable effect on any measure of child nutrition in age-based societies. The effect sizes are large relative to in-sample variation in child health: an additional year of the

[6] Sub-clans are a proxy for the extended family, but sub-clan names are self-reported in our data and we do not observe genealogical relationships among members or know whether all groups use the same definition for clan membership.

[7] This result is not driven by lower economic engagement or altruism of older members of age set societies in general, since we find large within-cohort consumption spillovers after restricting the sample to older individuals.

program increases child weight by 0.15 standard deviations and reduces the likelihood of malnourishment by 5.5% in kin-based societies, and has no effect on any parameterization of child weight in age set societies.

We report several additional results that support a causal interpretation of the findings. First, we construct a placebo pension exposure measure based on extended household members who are *just below* the age of pension receipt. We find no differential effect on societies with and without age sets of this placebo measure, suggesting that the effect is not driven by the selection of households with more or fewer older household members. Second, we replicate our baseline estimates using the *2006 round of the DHS*, prior to the introduction of the pension program pilot. Again, we find no differential effects, indicating that the results are not driven by pre-existing trends. Third, we find qualitatively similar results using an alternative estimation strategy that only exploits program variation across districts and does not exploit the additional variation in program exposure across households. These estimates indicate that the baseline results are not driven by differential changes in pension program exposure, or any other feature of household composition, in response to the pension pilot program.

Additional evidence presented throughout the analysis shows that the different structure of financial ties and policy spillovers in age set societies is not driven by other cultural or social characteristics. First, we present a broad range of qualitative, ethnographic work on age set organization in Section II that is consistent with our findings and proposed mechanism. Second, both across ethnicities in our sample and across households in each empirical setting, we do not find evidence that age set organization is strongly correlated with other observable features of culture or social organization, including customs related to marriage, inheritance, gender, and local politics; household composition; baseline measures of child nutrition; the prevalence of violent conflict; and pre-colonial economic development. This could be due to the fact that our relatively narrow geographic focus holds many features of society fixed. While social structure is not randomly assigned and likely co-evolves with other features of society, these results indicate that our findings are not simply driven by pre-existing trends or large differences between age set and kin-based societies in characteristics that might generate the results. Finally, controlling directly for the role of ethnicity-level political and economic organization does not affect our estimates in either part of the empirical analysis.

We conclude with a discussion of the broader implications of our findings for understanding economic inequality and vulnerability. Our results indicate that in kin-based societies, where we find strong connections between members of different ages, individuals may be well positioned to smooth consumption over the life-cycle. In age set societies, however, where these ties are weak, individuals at stages of life with less income earning potential (e.g. the young and the old) might consume systematically less and have fewer resources at their disposal. Returning to the expenditure data from the HSNP survey, we indeed find that while consumption is relatively flat over the lifecycle in kin-based societies, it is hump-shaped in age set societies, suggesting that age set systems may generate greater inequality across age cohorts and leave the young and old particularly at risk. In kin-based societies, however, we estimate greater inequality across sub-clans and find that the poorest sub-clans in kin-based societies consume substantially less than the poorest sub-clans in age set societies. By cutting across families, age sets may prevent any extended family from being left without access to

resources or any one clan from accumulating much more than another. These empirical patterns are a final indication that social organization is an important determinant of the structure of financial ties, and that a better understanding of local culture could guide policy targeting and design.

Our findings build on a range of work investigating the economic impacts of social structure. Most prior work has focused on features of kinship structure, including whether inheritance is patrilineal or matrilineal (La Ferrara, 2007; La Ferrara and Milazzo, 2017; Lowes, 2018a,b), whether the society is organized into segmentary lineages (Moscona et al., 2017, 2020), whether residence is matrilocal or patrilocal (Bau, 2021), and whether family ties are strong or weak (Greif, 1994; Alesina and Giuliano, 2010, 2014; Akbari et al., 2017; Enke, 2019; Schulz et al., 2019; Schulz, 2020; Ghosh et al., 2021). Our results highlight the importance of social organizations other than the family and how strong "horizontal ties" lead to distinct patterns of economic interaction.

The second part of our analysis builds especially on existing work probing the relationship between traditional customs and intergenerational transfers (Duflo, 2003; Anderson, 2007; La Ferrara and Milazzo, 2017; Jayachandran and Pande, 2017; Corno et al., 2020; Ashraf et al., 2020; Bau, 2021). The distributional effects of any development program can hinge on the strength of intergenerational investments, which we find are substantially curtailed in age set societies. Our results also build on a small body of work documenting that cultural context shapes the impact of policy (e.g. Ashraf et al., 2020); while there is growing awareness that the effects of any particular development policy could vary widely across cultures (World Bank, 2015), empirical analysis at this interface is limited.

Our study also contributes to a large literature investigating informal risk sharing and redistribution (e.g. Rosenzweig and Stark, 1989; Townsend, 1994, 1995; Udry, 1994; Ravallion and Chaudhuri, 1997; Fafchamps, 2003, 2011; Fafchamps and Gubert, 2007).[8] This paper is especially related to a growing body of work on the relationship between risk sharing and the structure of local networks (see Breza et al., 2019, for a review), including evaluations of risk pooling within family and caste groups (Munshi and Rosenzweig, 2006; Kinnan and Townsend, 2012; Ambrus et al., 2014; Angelucci et al., 2018).[9] Remaining agnostic about the efficiency of each network structure, we show that differences in social organization lead to distinct redistribution patterns, even among close ethnic groups subject to very similar economic conditions. An implication of this finding is that ethnographic data could be an important tool for predicting network structure where direct measurement is impossible.

Last, our findings contribute to an established anthropological literature on the social role of age set organization and other forms of "cross cutting ties"— relationships that cut across family-based groups (see Bernardi, 1985). Ethnographic accounts suggest that age set societies have a distinct pattern of social and economic interactions, in which within-cohort ties are favored over family ties (e.g. Lowie, 1921; Radcliffe-Brown, 1929; Eisenstadt, 1954; Dyson-Hudson, 1963; Bohannan, 1964; Morton, 1979; Kurimoto and Simonse, 1998; Spencer, 2014). While most ethnographic studies are from several decades ago, we show empirically that age set organization shapes modern financial ties and the impact of public policy.

[8] A range of theoretical work examines the formation of financial networks, mostly focused on the desire to minimize consumption risk (e.g. Kocherlakota, 1996; Bramoullé and Kranton, 2007; Bloch et al., 2008; Ambrus and Elliott, 2020).

[9] See also Morduch (2005), Mazzocco and Saini (2012) and Mobarak and Rosenzweig (2013) on caste networks in India, as well as Angelucci and De Giorgi (2009) on the importance of family ties.

This paper is organized as follows. The next section describes age set organization, as well as our sample, and discusses qualitative work on the affect of age sets on financial ties. Section III investigates consumption spillover effects in age-based compared to kin-based societies in a large unconditional cash transfer experiment in Kenya. Section IV analyzes how kin-based vs. age-based social structure shapes the effects of Uganda's national pension program on children. Section V discusses additional implications of our findings and Section VI concludes.

II. Age Set Systems

A. *Defining and Identifying Age Set Organization*

Age set societies are ethnic groups in which the dominant social group is the "age set," a group of men, and sometimes women, of a similar age. Individuals in an age set are "initiated" into adulthood at the same time (and often under a common name), move through life together, and turn to each other for social and economic support. In the words of Radcliffe-Brown (1929, p. 21), one of the first to develop the terminology, an age set is defined as:

> A recognized [group] consisting of persons (often male persons only) who are the same age [...] In Africa, at any rate in East and South Africa, an age set is normally formed of all those males who are initiated at one time. Once a person enters an age set [...] he remains a member of the same age set for the remainder of his life.

These age based groups often take priority over family or kin relationships, and individuals have a stronger sense of obligation to their age set than to their extended family (e.g. Eisenstadt, 1954).

Age set societies are widespread, and they are characterized by Lowie (1921) as the "most important example of an alternative to kinship-based organization." Well-studied examples, from all regions of sub-Saharan Africa, include the Oromo of Ethiopia (population 27 million); the Zulu and Sotho of South Africa (population 11 and 6.5 million respectively); the Maasai and Kikuyu of Kenya and Tanzania (population 1.65 and 8.1 million respectively); the Iteso and Karimojong of Uganda (population 3.2 and 1.2 million respectively); and the Tiv of Nigeria (population 6.5 million).[10] Based on our data, there are roughly 210 million individuals in sub-Saharan Africa today who are members of societies in which age sets are the traditionally dominant social form (see Appendix A.6).

B. *Our Sample: Age Sets in Kenya and Uganda*

Our empirical analysis focuses on policy experiments in Kenya and Uganda. For the societies in these regions, we determined whether or not age set organization is the dominant form of social organization using the definition from Radcliffe-Brown (1929).[11] Data on the presence of age set organization is not available from standard data sets, including Murdock (1967)'s *Ethnographic Atlas*

[10] For references on the age set organization of the aforementioned groups, see Baxter et al. (1979) on the Oromo; De Heusch (1985) on the Zulu; Spencer (2014) on the Maasai; Foner and Kertzer (1978) on the Kikuyu; McCluskey (2013) on the Iteso; Dyson-Hudson (1963) on the Karimojong; Bohannan (1964) on the Tiv. Population estimates were taken from the most recent census data for each country.

[11] It is possible for an ethnic group to have both age sets and a kinship structure. While many groups have either a strong lineage structure *or* a strong age-based structure, others exist along a spectrum. In Appendix A.1 we describe in detail and provide clear examples of our coding strategy for determining which of the two forms of organization is dominant.

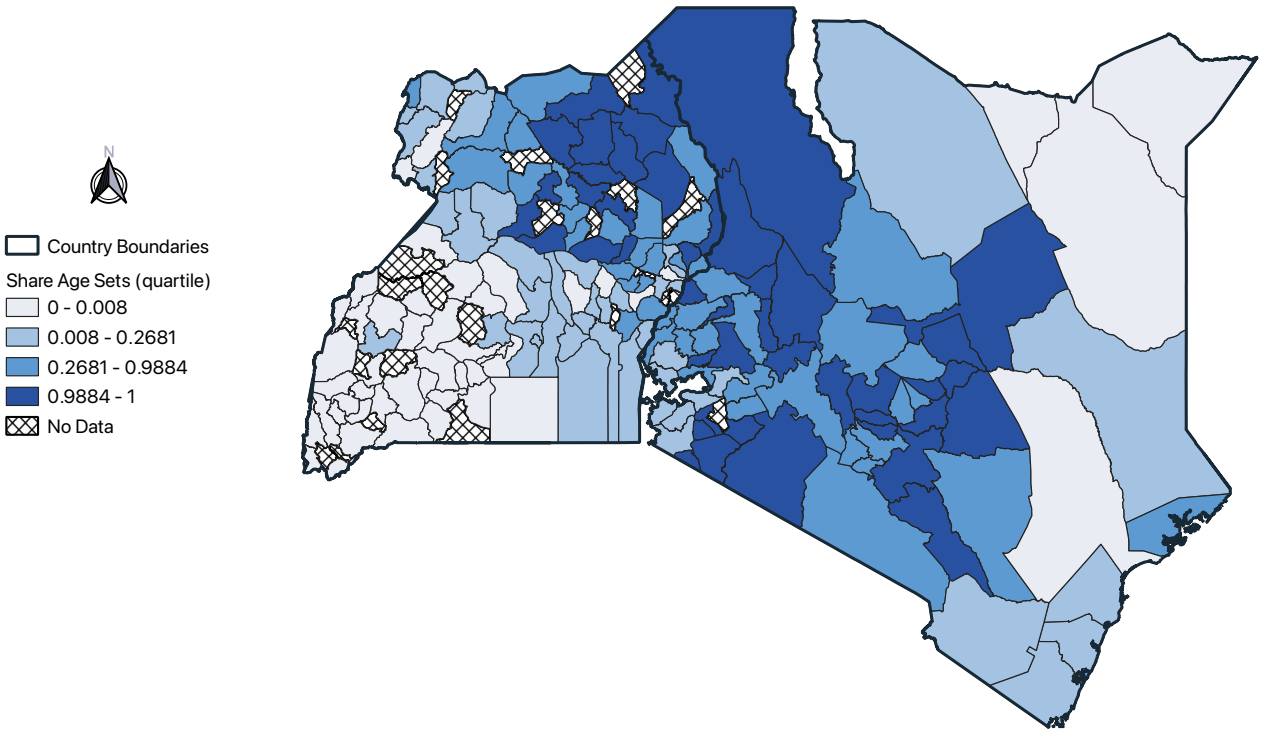


Figure 1: This map displays district boundaries in Uganda (left) and county boundaries in Kenya (right), as well as country borders in bold. Regions are color-coded based on the share of Demographic and Health Survey (DHS) households in each district that are members of age set societies. Districts are divided into four quartiles based on the share of the population comprised of members of age set societies, with darker colors corresponding to higher shares. The data are from the most recent geo-coded wave of the DHS in each country; in Kenya this is the 2014 round and in Uganda it is the 2016 round.

(used frequently in empirical studies of social structure, e.g. La Ferrara, 2007; Enke, 2019; Ashraf et al., 2020; Bau, 2021); thus, we determined ourselves whether or not each ethnic group is an "age set society" on the basis of extensive secondary source analysis. In Appendix A.1, we list all ethnic groups in our sample, whether or not each is an age set society, and the set of sources used to make that determination. We do not include an ethnic group in our sample unless we were able to determine with certainty whether it is an age set society or not. In our analysis of Kenya's HSNP (Section III), we were able to code our age set variable for 99% of the sample, and in our analysis of Uganda's pension program using DHS data (Section IV), we were able to code our age set variable for 85% of the sample.

Figure 1 documents the geographic variation of age set organization in Kenya and Uganda. The figures are constructed using individual-level data from the latest round of the Demographic and Health Survey (DHS) in each country that contains both district identifiers and information about each respondent's ethnicity. Each district is colored based on the share of surveyed households that we identify as belonging to an age set society. Members of age set societies make up 72% of the households in Kenya and 29% of the households in Uganda. While here we show district-level variation, in our empirical analysis, we use only within-district variation in ethnicity and age set organization;

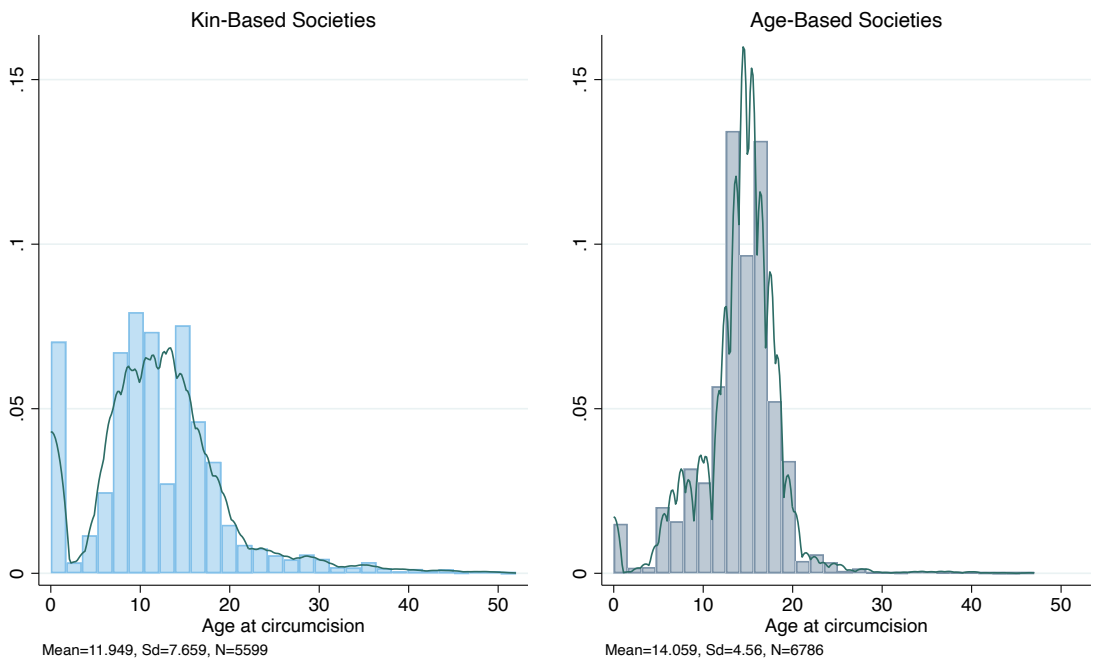


Figure 2: Histograms display the age of circumcision for all male respondents in the 2014 and 2016 DHS surveys for Kenya and Uganda respectively, separately for households from kin-based societies (left) and households from age set societies (right).

we display the aggregated data here for visualization.

The sources that we use to determine whether each ethnic group has age sets are historical, and as a result, Figure 1 should be interpreted as capturing the share of individuals who are members of ethnic groups in which age sets were the traditionally dominant social unit. Nevertheless, we also use the DHS to investigate the extent to which one age set custom has persisted today. A key feature of age set societies is an initiation ritual (Radcliffe-Brown, 1929, p. 21); in East Africa, the initiation ceremony often involves circumcision and takes place at around the age of puberty (Spencer, 2014; Handley, 2009). Data on circumcision rituals are collected systematically by the DHS and allow us to directly investigate the prevalence of initiation rituals across ethnic groups. If age set customs are practiced today, we would expect that in age set societies: (a) the timing of circumcision is coordinated and (b) circumcision is more likely to take place around the time of puberty.

Figure 2 displays a histogram of the age of circumcision for all DHS respondents, separately in societies with and without age sets; the mean and standard deviation of each distribution is reported at the bottom of the graph. Men in age set societies are less likely to be circumcised at birth, more likely to be circumcised during the age of puberty, and the standard deviation of distribution of the age of circumcision is lower, suggesting coordination. These features of the data exist both in rural and urban settings when we plot the distributions separately (see Figure A1). We interpret this pattern as a reassuring check that, consistent with qualitative accounts, age set ceremonies are prevalent today and discernible in our data.

C. *The Function and Origin of Age Sets*

The determinants of age set organization have not been a major emphasis of anthropological or ethnographic work, which has instead focused on describing and understanding the functioning and consequences of age sets. However, while there is no broadly accepted theory on the origins of age set organization, several hypotheses have been proposed.

In several contexts, age sets are used to organize men in battle; this has led LeVine and Sangree (1962) to hypothesize that age set organization began as a military innovation in response to the threat of external conflict. Consistent with this hypothesis, Zulu age set organization increased in importance during the rule of Shaka Zulu, a famous leader and military strategist who organized warriors into barracks and fighting regiments based on their age set (Eldredge, 2014). Among several East African age set societies, particularly herding societies, the role of age sets in fighting remains particularly important; Morton (1979, p. 90) notes, "[T]he age set system represents the principal means for organizing manpower for the purpose of protecting the group against forcible intrusions from the outside and conducting offensive warfare against neighboring groups."

Another possibility is that age set organization developed as a strategy to regulate political succession. In some age set societies, each cohort has a unique political role as part of an age-based hierarchy; the age set system determines who (i.e. which cohort) has political and decision making authority (Dyson-Hudson, 1963). Third, the age set system is often related to marriage institutions and gender roles. An individual's age set, and the marriage status of members of older adjacent age sets, can determine whether or not he is permitted to marry and, at times, his right to have children (Morton, 1979). Recent ethnographic work from Kenya suggests that the age set system remains a male-dominated institution, and that the social network opportunities it provides are not open to women (Handley, 2009).

A final view in the anthropological literature suggests that there are no clear causal factors leading to the development of age set organization; instead, age sets emerged through a complex evolutionary diffusion process likely originating in the region of the Oromo in Ethiopia (Beckingham and Huntingford, 1954; Hinew, 2012). This hypothesis follows a growing set of work arguing that social structure in general emerges in ways that can be idiosyncratic and not systematically related to any set of causal factors (Smith, 1956; Salzman, 1978; Kelly, 1983). This hypothesis is consistent with Moscona et al. (2020), who find no clear social, political, or geographic determinants of lineage-based organization. The idea that age set institutions could have diffused historically across space is one advantage to our within-country focus, comparing the behavior of members of societies with and without age sets in the same small geographic area.

We investigate the plausibility of each of these hypotheses in our sample of ethnic groups from Kenya and Uganda. We compile a range of ethnicity-level characteristics, from Murdock (1967)'s *Ethnographic Atlas* and several other sources described in Appendix A.2. We do not find evidence of systematic differences between age set and kin based societies across a broad range of characteristics. Our twenty-nine ethnic groups appear similar across our measures of violent conflict and herding, the transfer of political power, characteristics of marriage and inheritance, the role of women, and

pre-colonial development.[12] These estimates are described and reported in Appendix A.3.

D. Age Sets and Economic Ties: Qualitative Evidence

Numerous ethnographic studies have documented that age set organization shapes patterns of economic interaction. Qualitative accounts suggest that members of age set societies have both stronger economic ties to individuals in their age cohort and weaker ties to members of other generations, including within their own family.

In one early study, Eisenstadt (1954) notes: "The relations between age mates [involve] general and permanent obligations of co-operation, solidarity, [and] mutual help, closely resembling, in this respect, the family and kinship." Age sets play a central role in determining individuals' economic relationships and sense of identity. In the words of Dyson-Hudson (1963, p. 376), whose work focuses on the Karimojong cluster of ethnicities in Uganda, which form part of our sample, "An age set has members [...] who are equally uniformly identified by a single shared name, community of status, and a collective role." The fact that members of an age set share a singular identity is common to age set societies throughout sub-Saharan Africa. Morton (1979, p. 82) avers that the "highest correspondence [across East African age sets societies] exists in the manner in which egalitarian behavior among age set coevals is encouraged."

One of the most well-studied age set societies is the Maasai, who live between Kenya and Tanzania. Spencer (2014) describes that redistributing resources with age set members is both widespread and expected. During the initiation period, members of Maasai age sets "cultivate and parade an ethos of sharing," which is characterized by "an excessive display of 'group indulgence,' opposed to any suggestion of self interest" (Spencer, 2014, p. 45). Sharing of resources within the age set is not limited to *young* men: "[Later in life, Maasai men] share milk, meat, and the marital bed with age mates" (Spencer, 2014, p. 46). Age set members also often host each other for days at a time, and Maasai households have specific rooms that are meant for visiting age mates (Hodgson, 1999).

Age sets take on a similar role among several ethnic groups in Northern Kenya, the setting of the first part of our empirical analysis. Contemporary field notes by Handley (2009) document that among these age set societies—including the Samburu, Rendille, and Turkana—within-cohort ties are economically important. She paraphrases one interviewee:

> [T]hose who are rich and those who are poor [in the age set] come together so that they may share milk, meat, tea, sugar, etc. so it puts everyone as equal. [I]t is then that you can't differentiate between rich and poor because they are covering each other. Bonding within the age set helps because the morans [age mates] can rely on each other even if you have no money or social problems.

Thus, in age set societies, within-cohort economic relationships are strengthened as individuals rely on members of their age cohort for support.

[12] We do find a statistically significant difference between societies with and without age sets in the case of jurisdictional hierarchy. It is possible that this relationship is due to random chance, given the number of separate hypotheses that we check (see Table A4). Nevertheless, we document that all of our results are very similar after accounting for differences in levels of jurisdictional hierarchy at the ethnicity-level.

At the same time, according to ethnographic accounts, individuals in age set societies tend to rely *less* on family and intergenerational relationships. Maasai men often do not consider individuals outside their immediate family as part of their "lineage," as "it is toward age mates that men look for support rather than brothers or close patrilineal kin" (Spencer, 2014, p. 48). The lack of intergenerational support is noted explicitly as one of the key functions of Northern Kenyan age sets, which exist in part "so that the pressure is taken off the mother's house" (Handley, 2009). According to another interviewee from the Samburu, "The group of morans [age mates] are the ones who have more responsibilities to each other, and *they are bound more to their fellow moran than they are to their brothers or sisters*" (Handley, 2009, emphasis not in original). Bohannan (1964) writes that among the Tiv, the social bond and sense of obligation among age mates can be stronger than those even between parents and children. Occasionally, the relationship across cohorts and generations is not only weak, it is adversarial; Foner and Kertzer (1978) document that across age set societies, conflict sometimes breaks out between age sets during periods of initiations since age sets in a position of power are reluctant to relinquish their status.

Together, these accounts suggest that age set societies have very different structure of allegiance and support than those typically analyzed. The dominant social group is the age cohort, and these horizontal ties are more important than kin-based relationships. The next sections document empirically how this distinct form of social organization affects economic interactions and the distributional effects of development policy.

III. Social Structure and Financial Ties: Experimental Evidence

This section analyzes a randomized evaluation of a large-scale cash transfer program—the Hunger Safety Net Program (HSNP)—in Northern Kenya. The experimental design allows us to estimate both within-cohort and across-generation spillover effects of the unconditional cash transfer, in both age set and kin-based societies. We document strong within-cohort spillover effects in age set societies that are absent in kin-based societies. We also find inter-generational spillover effects in kin-based societies that are absent in age set societies. These results indicate that local social organization shapes modern financial ties and the distributional impact of development policy.

A. Setting

Kenya's Hunger Safety Net Program (HSNP) is a large-scale cash transfer program in Northern Kenya.[13] In its first phase, which took place between 2009-2012, it reached over 69 thousand households; after 2012, it expanded to include 374 thousand households, corresponding to over 2.1 million individuals. The program's aim is to reduce extreme poverty by means of regular and substantial cash transfers. While the program is now widespread in the country, it was first piloted in 2009 in the regions of Mandera, Marsabit, Turkana and Wajir, displayed in Figure 3.

The government of Kenya, together with Oxford Policy Management, selected 48 sub-locations to conduct a randomized policy evaluation (see Merttens et al., 2013).[14] The 48 sub-locations were

[13] The raw data and documentation are available at: https://microdata.worldbank.org/index.php/catalog/1915.
[14] A sub-location is a super-set of the village.

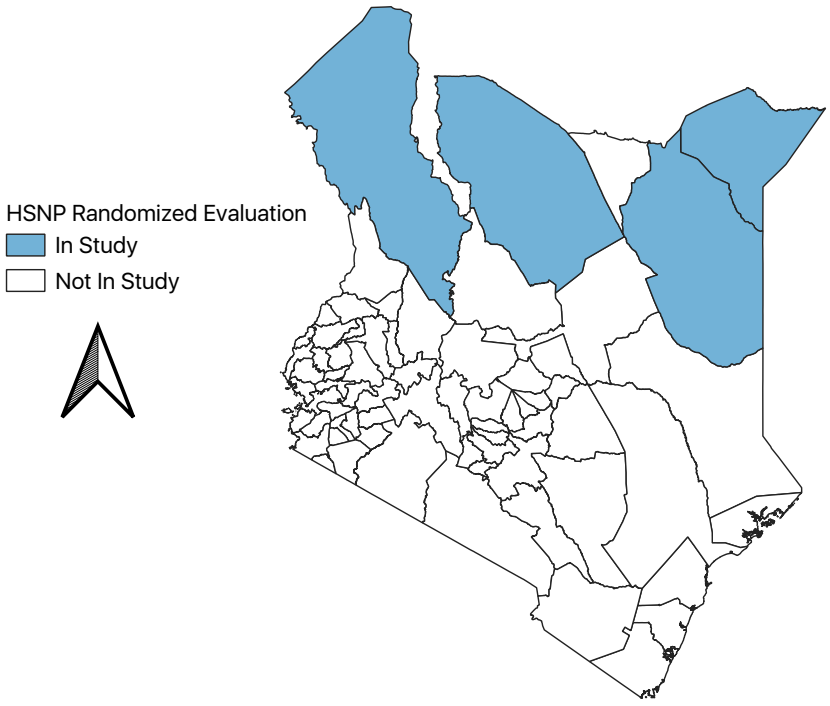


Figure 3: Map showing the counties in Kenya included in the Hunger Safety Net Program (HSNP) randomized evaluation. These districts are (from left): Turkana, Marsabit, Wajir, and Mandera.

randomly assigned to either the treatment or control group. Households in both treated and control sub-locations were interviewed at baseline (2009) and follow-up (2011); eligibility to receive the cash transfer was determined based on one of three targeting mechanisms, randomized across both treatment and control groups.[15] Eligible households were identified in both treatment and control groups, but only eligible households in the treatment group began receiving transfers following the baseline survey; transfers were withheld from eligible households in the control group until after the first follow-up survey in 2011. The cash transfer consisted of 2500 KSh ($\sim$ \$23 USD) distributed every two months, corresponding to roughly 25% of annual in-sample household income. Substantial care was taken to ensure that only the intended recipients received the cash transfer; in an endline survey, less than 2% of intended beneficiaries reported issues with receiving their payment, and biometric fingerprinting was used to make sure that the funds could not be taken by non-beneficiaries.[16]

A crucial feature of this policy experiment is that there are members of age set and kin-based societies in both eligible and non-eligible sub-groups and in both treatment and control sub-locations.

[15]The targeting mechanisms were community based targeting, in which the community selected households to get the transfers; dependency ratio targeting, in which households were selected based on characteristics of household health and nutrition; and a social pension program, in which households were selected on the basis of the number of household members over the age of 55. We include all targeting mechanisms in our main analysis, and document that all findings are robust to the inclusion of targeting code by ethnicity fixed effects.

[16]The payment system is described in detail in Oxford Policy Management (2011); for example, "Payments are made using a Smartcard. The Smartcards contain a microchip with the biometric fingerprints of the two nominated recipients of each beneficiary. [...] Cash is transferred electronically to the Smartcard and can be redeemed at any time at any of the agents using fingerprint scanning on Point of Sale devices (POS). Where electricity is not available, the POS are run by solar power." (p. 13)

We are unaware of any other randomized evaluation with members of both kin-based and age-based groups in the participant population, as well as all necessary data for the estimation of policy spillover effects (see Section B). This heterogeneity in participant ethnicity makes it possible to estimate spillover effects from the cash transfer program separately for members of societies with and without age sets.

B. Data

This section describes the data collected during the HSNP evaluation that we use in our empirical analysis. First, using each home language listed in the HSNP baseline survey, we determine whether or not age set organization is the dominant social form for all households in the sample. This was done by hand from a range of secondary source material about the social structure of ethnic groups in Northern Kenya, described in Appendix A.1. The languages reported in the survey have a one-to-one correspondence with ethnicity, which allows us to straightforwardly link the two.

Second, the baseline HSNP data set reports treatment status of each sub-location and eligibility status of each household, as well as the village and sub-location in which each household is located. This allows us to identify the treatment status of each household. The baseline data also report the age of each household member, which is necessary for our estimation of cohort-level spillover effects.

Third, the baseline and follow-up surveys report a range of household and individual-level information that allow us to construct the main dependent variables. Household-level consumption information is reported, which we use to identify consumption spillovers. Expenditure is broken down by purpose; in our empirical analysis, we rely primarily on estimates of total spending, spending on food, and spending on education. The HSNP also reports information on the weight and height of all children under the age of five, which we use to estimate spillover effects on young children.

Finally, the baseline survey includes a range of additional information that we use to construct control variables to investigate the robustness of our findings. These covariates include information about health status, religion, marriage status, educational attainment, wealth, and a range of individual-level demographic information on each household member.

C. Within-Cohort Ties

This section investigates spillover effects within age cohorts. Our main hypothesis is that in age set societies, there are large spillover effects of the random cash transfers within the age cohort and that these effects are smaller or absent in kin-based societies.

C.1 Defining Age Cohorts

We first construct a proxy for the share of people in an individual i's "age set" that was eligible for the cash transfer program:

$$\text{Share Cohort Eligible}_{iaev} = \Big(\sum_{\substack{i' \neq i \\ i' \in a \times e \times v \times f(i)}} \text{Eligible}_{i'} \Big) \Big/ \Big(\sum_{\substack{i' \neq i \\ i' \in a \times e \times v \times f(i)}} \text{Eligible}_{i'} + \text{NotEligible}_{i'} \Big) \quad (1)$$

where i indexes individuals, a indexes age cohorts, e indexes ethnic groups, v indexes villages and $f(i)$ denotes the gender of i. In words, Share Cohort Eligible$_{iaev}$ is the share of eligible people in an individual's age cohort—defined as being the same age and gender, residing in the same village, and being from the same ethnic group— excluding the individual himself.[17] We include only individuals of the same gender as the respondent since in this context, age sets involve predominately males and when female age organization exists, it is distinct from the male system (Handley, 2009). Finally, when we focus on household-level consumption we assign each household the age set treatment of the main provider for the household.[18]

C.2 Empirical Model

We estimate the effect of changes in cohort-level income on consumption in age set vs. kin-based societies. To do this, we exploit the fact that the experiment generated variation across cohorts in total transfer eligibility, but transfers were only delivered to those cohorts in sub-locations randomly assigned to the treatment group.

The empirical strategy and main result can be described graphically by the bars reported in Figure 4. We present the correlation between Share Cohort Eligible$_{aev}$ (i.e. cohort-level eligibility) and (log of) consumption separately for four groups within the non-eligible (i.e. spillover) population: (1) age set societies in control locations, (2) age set societies in treatment locations, (3) kin-based societies in control locations, (4) kin-based societies in treatment locations. If our empirical design is valid, we expect no significant correlation between cohort-level transfer eligibility and consumption in control sub-locations, where cash transfers were never delivered; this is precisely what we find in columns (1) and (3). If our main hypothesis is true, in treatment locations we expect cohort-level eligibility to affect consumption spending in age set societies (2) but not in kin-based societies (4). This is precisely the pattern we find in the data, a first indication of large within-cohort spillovers in age sets societies that are absent in kin-based societies.

$$\begin{aligned} y_{iaev} =& \gamma_0 + \gamma_1 \cdot \left(\text{Share Cohort Eligible}_{aev} \cdot \mathbb{I}^{\text{Treat}}_{v(c)} \cdot \mathbb{I}^{\text{AgeSet}}_{e(i)}\right) + \gamma_2 \cdot \left(\text{Share Cohort Eligible}_{aev} \cdot \mathbb{I}^{\text{Treat}}_{v(c)} \cdot \mathbb{I}^{\text{Kin}}_{e(i)}\right) \\ &+ \gamma_3 \cdot \text{Share Cohort Eligible}_{aev} \cdot \mathbb{I}^{\text{AgeSet}}_{e(i)} + \gamma_4 \cdot \text{Share Cohort Eligible}_{aev} \cdot \mathbb{I}^{\text{Kin}}_{e(i)} + X'\Gamma + \varepsilon_{iaev} \end{aligned} \tag{2}$$

where i indexes individuals, a age cohorts, e ethnic groups, v villages, and c sub-locations. The dependent variable is (log of) expenditure of the household of main provider i, and Share Cohort Eligible$_{aev}$ is defined as in (1). $\mathbb{I}^{\text{Treat}}_{v(c)}$ is an indicator that equals one if sub-location c was assigned to the treatment group; $\mathbb{I}^{\text{AgeSet}}_{e(i)}$ is an indicator that equals one if e is an age set society and $\mathbb{I}^{\text{Kin}}_{e(i)}$ is an indicator that is

[17] While for some groups in our sample, like the Turkana, we know that age sets are initiated each year, in others an age set can contain individuals who are not exactly the same age. Unfortunately, we do not have data on the exact timing of initiation ceremonies; however, in all age set societies, individuals in the same cohort are part of the same age set. Thus, we use the above single-year measure as a conservative proxy for an individual's age set throughout the empirical analysis. Consistent with the fact that in some groups age sets include more than one birth year, Figure 5 shows some evidence of spillover effects to nearby cohorts.

[18] That is, we let Share Cohort Eligible$_{haev}$ = Share Cohort Eligible$_{ihaev}$ where $i \in h$ is the main provider. The results are all very similar and reported in the Appendix Table A5 if we instead use age of the household head to assign each household to a cohort.

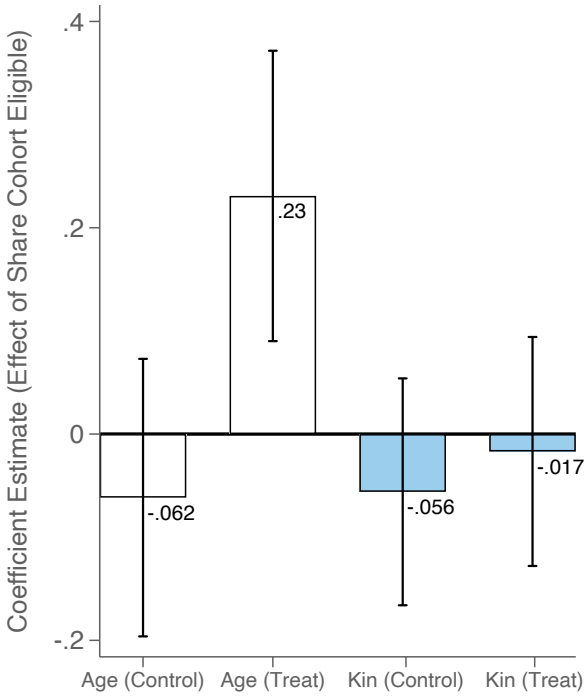


Figure 4: **Cohort-Level Eligibility and Consumption, Separately by Treatment Status and Social Structure** Each bar reports the coefficient estimate of the relationship between a main provider's household consumption spending and Share Cohort Eligible$_{iaev}$. The regression is estimated on the sub-sample noted at the bottom. From left, these are: age set societies in control sub-locations, age set societies in treatment sub-locations, non-age set societies in control sub-locations, non-age set societies in treatment sub-locations. Interviewer and targeting code by ethnicity fixed effects are included in all specifications. 95% confidence intervals are reported.

equal to one if ethnicity e is a kin-based society. The model is also fully saturated with all components of the triple interaction (excluded from (2) for simplicity).

The coefficients of interest are γ_1 and γ_2. These capture the effect of the cohort-level income shock on consumption spending, separately for members of age set and kin-based societies. The main hypotheses are that $\gamma_1 > 0$ and furthermore that $\gamma_1 > \gamma_2$. That is, in age set societies, resources spill over within age cohorts and do so more than in societies without age sets.[19] We also explore the robustness of our baseline findings to the inclusion of additional fixed effects and control variables, embodied in X'.

[19]Of additional interest are γ_3 and γ_4, which capture differential selection of particular cohorts into HSNP eligibility in societies with and without age sets. If consumption is correlated within age cohorts, we would expect these terms to be negative since individuals with low levels of consumption are more likely to be in cohorts with a large number of transfer-eligible members. If consumption is *more correlated within age cohorts in age set societies compared to kin-based societies*, we would expect $\gamma_3 < \gamma_4$. We find evidence that both hypotheses are true (see Figure A3). These findings motivate our triple difference design that directly accounts for these selection effects and makes it possible to compare cohorts with the same eligibility status across sub-locations that were randomly assigned to the treatment or control group.

Table 1: Age Cohort Spillover Effects On Consumption Spending

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Log Total Consumption Spending				Total Cons. Spending
	Panel A: Full Sample				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.258	0.339	0.279	0.287	2,481
	(0.107)	(0.101)	(0.0976)	(0.105)	(966.9)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.00613	0.00364	0.0218	0.0315	-815.3
	(0.0761)	(0.0798)	(0.0799)	(0.0799)	(619.9)
p-value, $\gamma_1 = \gamma_2$	0.0550	0.0116	0.0528	0.0619	0.0052
Mean at baseline	7.40	7.40	7.40	7.40	9276.93
R-squared	0.471	0.628	0.682	0.684	0.673
Observations	713	646	646	643	643
	Panel B: Males Only				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.365	0.443	0.344	0.377	4,076
	(0.116)	(0.103)	(0.0965)	(0.105)	(1,036)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.00234	0.0194	0.0487	0.0499	-698.9
	(0.0723)	(0.0831)	(0.0834)	(0.0874)	(700.4)
p-value, $\gamma_1 = \gamma_2$	0.0111	0.00129	0.0218	0.0150	0.0003
Mean at baseline	7.42	7.42	7.42	7.42	9443.83
R-squared	0.487	0.663	0.703	0.710	0.689
Observations	603	548	548	545	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	No	Yes	Yes	Yes	Yes
Additional Controls	No	No	Yes	Yes	Yes
Age Set x Cohort Eligibility FE	No	No	No	Yes	Yes

Notes: The unit of observation is a household. In Panel A, we include the full sample of non-beneficiary households and in Panel B we include only households with a male main provider. The dependent variable is log of per capita monthly consumption spending in columns 1-4 and raw per-capita monthly consumption spending in column 5. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are clustered at the sub-location level.

C.3 Results

Table 1 reports our baseline estimates of Equation 2. In Panel A, the sample includes all main providers in the sample, and in Panel B it is restricted to male main providers; in Northern Kenya, age sets are a predominately male institution and we expect the results to be driven by this subsample (Handley, 2009).[20] In columns 1-4, the dependent variable is log of per-capita monthly consumption spending, and in column 5 it is total per-capita consumption spending.

In the first column, we control only for interviewer and targeting code by ethnic group fixed effects, as well as the baseline value of the dependent variable. These controls fully absorb any average differences across ethnic groups, separately for each arm of the transfer program. We find

[20]Moreover, female main providers are a very selected sample. 57% of female main providers are widowed or divorced, compared to 4% of male main providers.

strong evidence of within-cohort spillover effects in age set societies ($\gamma_1 > 0$) and no evidence of within-cohort spillover effects in kin-based societies ($\gamma_2 = 0$). γ_1 is larger in magnitude focusing on the male sub-sample (Panel B). The remaining columns show that the findings are very similar after including additional fixed effects and controls. In column 2, we control for age by ethnicity fixed effects, to fully absorb any differences in lifecycle consumption patterns across ethnic groups. In column 3, we add a broad range of individual and household-level controls, listed in the table notes, and in column 4 we control for the age set indicator interacted with fixed effects in the cohort level shock, in order to flexibly capture any level differences in cohort eligibility across ethnic groups. The estimates are very similar in both cases. Finally, in column 5 we document that the results are similar if we use total consumption instead of log-transformed consumption as the dependent variable. γ_1 is larger than γ_2 in all specifications, and the p-value of the difference between γ_1 and γ_2 is reported below each set of coefficients.

Our estimates suggest that a one standard deviation increase in age cohort cash transfers leads to a roughly 0.3 standard deviation increase in consumption spending in societies with age sets, and zero effect in societies without age sets. Stated differently, for an individual in the non-eligible (i.e. spillover) group in an age set society, every additional cohort member treated by the cash transfer program leads on average to a $16 USD increase in yearly consumption spending and a $23 USD increase in yearly consumption spending when we restrict attention to the all male sample (Panel B). This corresponds to roughly 15% of the size of the cash transfer, suggesting that a large share of the transfer is reallocated within the cohort; moreover, it corresponds to roughly 8% of the median in-sample income at baseline, suggesting that the within-cohort spillover effects of the cash transfer program are large relative to local income.

The findings are very similar and, if anything, more precise when we use food spending rather than total spending as the dependent variable. These estimates are reported in Table 2, which follows the exact same structure as Table 1. Across specifications, the difference between γ_1 and γ_2 is significant at the 1% level. This finding is consistent with the fact that the main purpose of the HSNP is to improve food security, and suggests that consumption spillover effects are concentrated on essential items in a population close to subsistence.

All estimates are largest for young and old age cohorts, with a more limited effect on individuals aged 30-50 (see Figure A5). This pattern suggests that the age set structure continues to affect the consumption patterns of younger cohorts, where we observe large cohort-level spillovers, and will thus likely remain an important feature of society. These heterogeneous effects across the lifecycle are also consistent with the cohorts that have less income earning potential themselves (the young and old) relying disproportionately on the age set network.

Falsification Tests We estimate a series of falsification tests to further convey that in age set societies spillover effects are contained within the age set. For each individual, we compute the share of transfer-eligible individuals in the same village and (i) in cohorts 2-5 years away, (ii) in cohorts 6-10 years away, (iii) in cohorts 11-15 years away, and (iv) in cohorts 16-20 years away. We then estimate a versions of (2) replacing the share of transfer-eligible people in an individual's *own* cohort with the

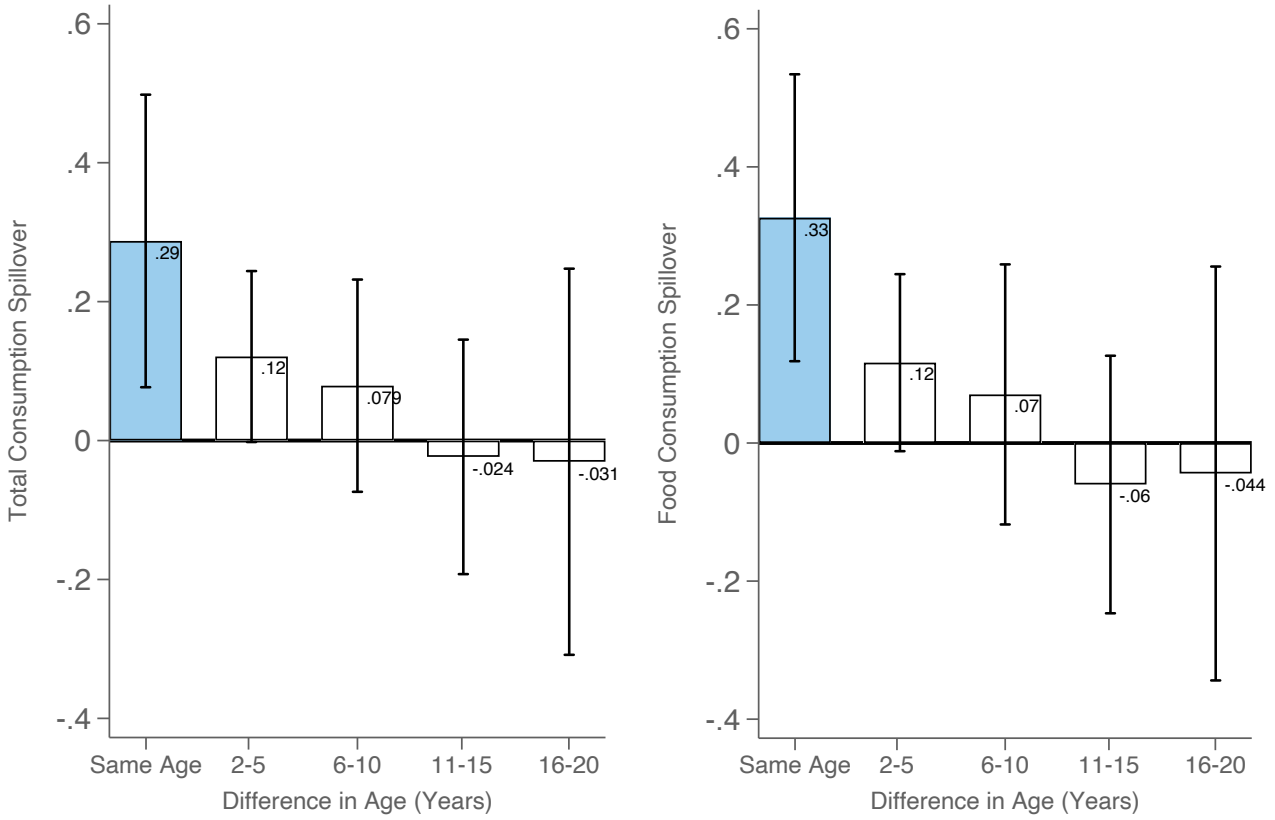
Table 2: Age Cohort Spillover Effects On Food Spending

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Log Total Consumption Spending				Total Cons. Spending
	Panel A: Full Sample				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.261	0.373	0.314	0.326	2,357
	(0.0992)	(0.0999)	(0.0981)	(0.103)	(840.0)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.0218	0.00949	0.0209	0.0390	-642.8
	(0.0891)	(0.0869)	(0.0776)	(0.0847)	(437.8)
p-value, $\gamma_1 = \gamma_2$	0.0428	0.00860	0.0255	0.0353	0.00254
Mean at baseline	7.16	7.16	7.16	7.16	7205.57
R-squared	0.352	0.550	0.619	0.624	0.590
Observations	713	646	646	643	643
	Panel B: Males Only				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.348	0.502	0.385	0.422	3,647
	(0.113)	(0.111)	(0.110)	(0.118)	(964.5)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.0146	0.0129	0.0578	0.0747	-390.0
	(0.0861)	(0.0904)	(0.0835)	(0.0936)	(603.2)
p-value, $\gamma_1 = \gamma_2$	0.0145	0.000822	0.0201	0.0182	0.000664
Mean at baseline	7.18	7.18	7.18	7.18	7322.30
R-squared	0.368	0.594	0.639	0.646	0.609
Observations	603	548	548	545	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	No	Yes	Yes	Yes	Yes
Additional Controls	No	No	Yes	Yes	Yes
Age Set x Share Eligible in Age Cohort	No	No	No	Yes	Yes

Notes: The unit of observation is a household. In Panel A, we include the full sample of non-beneficiary households and in Panel B we include only households with a male main provider. The dependent variable is log of per capita monthly food spending in columns 1-4 and raw per-capita monthly food spending in column 5. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are clustered at the sub-location level.

share of transfer-eligible people in the other cohort groups. In some cases, age sets include more than one cohort so we may expect consumption spillover effects from cohorts 2-5 years away; however, we hypothesize that they should be smaller than the spillover effects from an individual's own cohort and we do not expect to see any effects from cohorts greater than five years older or younger.

Our estimates of these spillover effects are reported in Figure 5. We report our estimate of γ_1 from each specification and show the results separately for total consumption (Figure 5a) and food consumption (Figure 5b). First, for comparison, we display the spillover effect from one's own cohort (leftmost bar). The remaining columns show the effect of transfer eligibility of individuals in the same village but in other cohorts; while, as predicted, the effect is positive (albeit insignificant) for close cohorts, it is very close to zero for all remaining cohort groups. This pattern highlights that spillover effects in age set societies are driven by an individual's own cohort, and not greater income sharing overall within the village.



(a) Total Spending

(b) Food Spending

Figure 5: **Effect of Own-Cohort vs. Other-Cohort Shocks.** Estimates of Equation (2) with the eligibility of a series of different cohorts used to compute the right hand side variables. The x-axis reports the cohort(s) relative to an individual's own cohort. The leftmost bar reports the spillover effect from an individual's own cohort, our baseline estimate. The dependent variable is (log of) total expenditure in 5a and (log of) food expenditure in 5b. All estimates are from the most conservative specification from Table 1 (column 4). Standard errors are clustered by sub-location and 95% confidence intervals are reported.

Sensitivity Analysis: Controls We next investigate the robustness of the estimates to controlling flexibly for ethnicity-level characteristics other than age set organization; these estimates are reported in Figure A4 and described in greater detail in Appendix Section B.1. To compile ethnicity-level covariates, we match the ethnic groups present in our sample to the corresponding societies in Murdock (1967)'s *Ethnographic Atlas*. We first flexibly control for each ethnicity's language group, thus homing in on within language-group variation in social structure. We then control directly for several measures of pre-colonial development. Our estimates remain similar, indicating that the results are driven by age set organization and not other omitted characteristics of the ethnic groups in our sample. Moreover, many additional ethnicity-level covariates are constant within our sample, which suggests that we are generally working with a comparable set of ethnicities that are similar across several important dimensions.[21] Finally, a potential concern is that members of highly-treated age

[21] Characteristics that are constant within our sample, according to Murdock (1967)'s *Ethnographic Atlas*, include: matrilocality/patrilocality, matrilineality/patrilineality, bride price customs, cousin marriage customs, and inheritance customs.

sets spend more not because of actual transfers from members of their age set but because, anticipating transfers in the future, they begin to spend out of their savings. This does not seem to be driving the findings, however, because only 8% of the sample reports having savings at baseline and the main findings are very similar if we exclude households with any savings from the sample (Table A6).

Sensitivity Analysis: Inference Our main estimates exploit differences in social structure across the full set of ethnic groups in the HSNP sample. This is a limited number of distinct groups, some of which comprise a relatively large share of the sample (e.g., the Somali make up 35% of the sample and the majority of the kin-based group). First, in order to make sure that the findings are not driven by any particular group, we replicate the baseline estimates after excluding each group from the sample one-by-one; in all cases, the coefficients of interest remain similar (see Tables A7 and A8).

Second, to investigate this question systematically, we conduct inference using resampling procedures. We generate placebo categorizations randomly assigning each ethnicity to either the age-based or kin-based group, both with and without replacement. The former ("bootstrapping") provides the correct coverage under the assumption that uncertainty derives from our sampling a (relatively small) set of ethnic groups from a larger population of ethnic groups. The latter ("randomization inference") provides the correct coverage under the hypothesis that uncertainty derives from the assignment of ethnic groups to the two types of social organization that we consider. We compute our estimates of $\gamma_1 - \gamma_2$ for each placebo assignment and estimate the randomization p-value as the share of placebo estimates larger than our baseline estimates. The distributions of placebo coefficients, as well as our actual estimates marked with a dotted line, are reported in Figure A6. Using the bootstrap, when the dependent variable is (log of) total consumption expenditure, $p = 0.047$ using the full sample and $p = 0.043$ after restricting the sample to males. When the dependent variable is (log of) food expenditure, the p-values are $p = 0.046$ and $p = 0.042$ respectively. Randomizing without replacement, the four p-values are respectively: $p = 0.114$, $p = 0.048$, $p = 0.112$, and $p = 0.040$.

Finally, we show that the precision of the results is similar if we double-cluster standard errors by sub-location and by "solidarity group," capturing the idea that errors may be correlated within the social group in which financial transfers takes place. We define the "solidarity group" as the age cohort in age-based societies and as the sub-clan in kin-based societies. Tables A9 and A10 reproduce our baseline results, with total spending and food spending as the dependent variables respectively, using this alternative clustering strategy.

D. Kin-Based and Inter-Generational Ties

The previous section documented large within-cohort spillover effects in age set societies, and found no evidence of within-cohort ties in the kin-based societies in our sample. While ethnographic accounts suggest that within-cohort links in age set societies substitute for inter-generational and family ties that prevail in kin-based societies, our results to this point are also consistent with members of age set societies sharing more income *in general*. In this section, we directly investigate the prevalence of within-lineage and inter-generational transfers across ethnic groups.

Since the HSNP does not report information about an individual's extended family, which would

Table 3: Age Cohort and Sub-Clan Spillover Effects On Consumption Spending

Dependent Variable:	(1) Log Total Spending	(2) Log Total Spending	(3) Log Total Spending	(4) Log Food Spending	(5) Log Food Spending	(6) Log Food Spending
	Full Sample	Full Sample	Males Only	Full Sample	Full Sample	Males Only
Share eligible in subclan * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	-0.127	-0.0359	-0.157	-0.0147	0.122	-0.0619
	(0.197)	(0.223)	(0.247)	(0.258)	(0.291)	(0.313)
Share eligible in subclan * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	0.248	0.363	0.404	0.378	0.480	0.503
	(0.209)	(0.206)	(0.198)	(0.223)	(0.234)	(0.242)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.387	0.507	0.542	0.312	0.424	0.461
	(0.151)	(0.151)	(0.164)	(0.161)	(0.162)	(0.188)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	0.0106	0.00996	0.0272	-0.0253	-0.0232	-0.00143
	(0.108)	(0.100)	(0.115)	(0.129)	(0.117)	(0.127)
p-value, age cohort shocks	0.043	0.008	0.011	0.102	0.030	0.045
p-value, clan shocks	0.202	0.191	0.067	0.254	0.337	0.148
Observations	436	430	371	436	430	371
R-squared	0.686	0.716	0.716	0.644	0.670	0.666
Interviewer FE	Yes	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes
Clan FE	No	Yes	Yes	No	Yes	Yes

Notes: The unit of observation is a household. The dependent variable is log of per capita monthly consumption spending in columns 1-3 and log of food spending in columns 4-6. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are clustered at the sub-location level.

allow us to estimate spillover effects within the kin network, we use two alternative approaches to capture kin-based financial ties. First, we estimate consumption spillover effects within each *sub-clan*; sub-clan identity is self-reported by a subset of the sample and is a rough proxy for the extended family group. Second, we focus on the pension program targeting mechanism built into the randomized experiment and estimate the impact of random transfers to older generations on child nutrition. This analysis of inter-generational transfers motivates a more extensive analysis in Section IV, where we study the roll-out of Uganda's national pension program.

Table 3 reports estimates from an augmented version of Equation 2 in which, in addition to the share of age cohort members eligible for the transfer interacted with treatment and kin or age based group indicators, we also include the share of sub-clan members eligible for the transfer interacted with treatment and kin or age based group indicators. While the results are less precise than our previous estimates, likely due in part to the smaller sample size and imprecision of the sub-clan variable, there are three main conclusions.[22]

First, we find no evidence of spillover effects within the sub-clan in age-based societies (row 1);

[22] A potential concern is that reporting information about sub-clan affiliation in the baseline survey could be related to the economic importance of sub-clan organization. It seems likely that this would bias us away from finding any effect, if members of age set societies for whom sub-clans are least important are endogenously excluded from the sample. This could be the case if, for example, all members of kin-based societies report sub-clan membership, while only members of age set societies form whom sub-clans are most important report sub-clan membership. This reporting difference would bias our estimates away from our hypothesized result.

all coefficient estimates are insignificant and close to zero. Second, we find some evidence of positive spillover effects within the sub-clan in kin-based societies (row 2). While the significance level fluctuates across specifications, all estimates are all positive, large, and of comparable magnitude to the cohort-level spillover effects in age set societies. Moreover, the precision of the estimates is similar when we conduct inference using the resampling procedures described in Section C.3. The distributions of placebo estimates and randomization p-values are reported in Figure A7; if anything, the randomization p-values for the difference between the effect of clan income shocks in age-based versus kin-based societies are slightly smaller using randomization inference. Finally, large within-cohort spillover effects remain apparent for age-based societies and not kin-based societies after accounting for sub-clan-level spillover effects from the transfer program (rows 3-4).

Next, we study inter-generational financial links in age set and kin-based societies, exploiting the pension program treatment arm in which transfers were given to all individuals in treatment locations over the age of 55. We restrict the sample to the set of eligible households in villages that were randomly assigned to the pension grant treatment arm of the experiment, and estimate the following equation:

$$y_i = \xi_1 \cdot \left(\mathbb{I}_{v(c)}^{\text{Treat}} \cdot \mathbb{I}_{e(i)}^{\text{AgeSet}} \right) + \xi_2 \cdot \left(\mathbb{I}_{v(c)}^{\text{Treat}} \cdot \mathbb{I}_{e(i)}^{\text{Kin}} \right) + X'\Gamma + \varepsilon_i \tag{3}$$

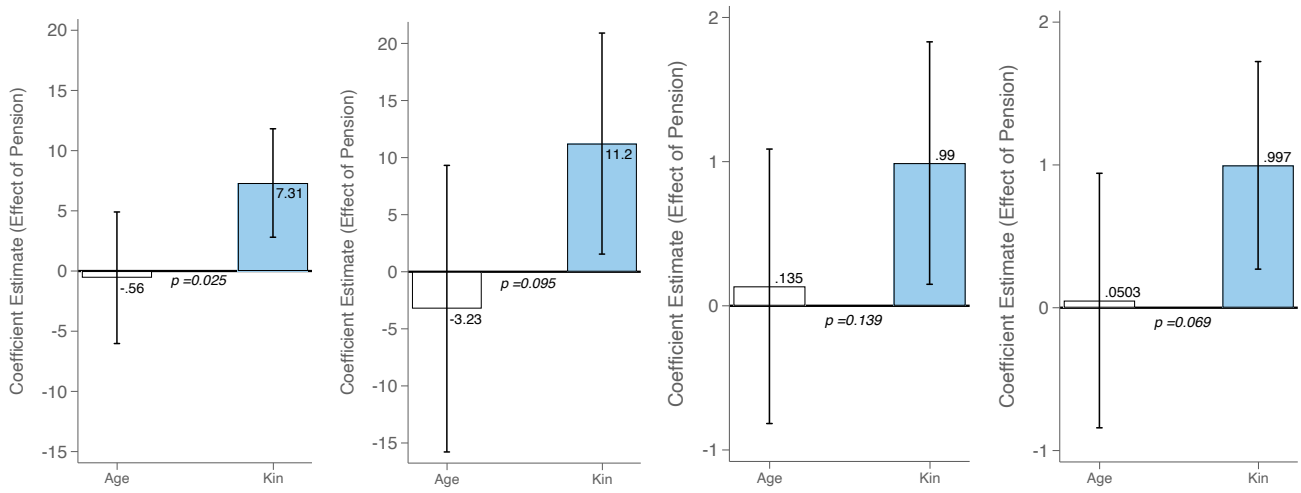
where i indexes either transfer-eligible households or *children in* transfer-eligible households (depending on the specification). Our main dependent variables are the weight-for-height of each child under five and household-level education spending; both capture changes in investment in younger generations.[23] ξ_1 captures the impact of the randomly-assigned pension program on our proxies for investment in children in age set societies, and ξ_2 captures the same for kin-based societies. We hypothesize that $\xi_2 > 0$ and moreover that $\xi_2 > \xi_1$; if inter-generational ties are fully absent in age set societies, we would find that $\xi_1 = 0$.

Figure 6 reports estimates of ξ_1 and ξ_2 from (3). In Figure 6a, the dependent variable is child-level weight-for-height; we find no effect of the pension program on child nourishment among age set societies (left bar), but a positive and significant effect among kin-based societies (right bar). When estimated on the sample of male children in Figure 6b, the effect is even larger in magnitude.[24] In Figures 6c and 6d the unit of observation is the household and the dependent variables are (log of) education spending and (log of) education spending as a share of total spending respectively. In both cases, we find zero effect of the pension program in age set societies but a positive and significant effect in kin-based societies.[25] While these estimates are less precise than those in the previous section since we restrict attention to one third of the full randomized evaluation, they clearly indicate major differences in patterns of inter-generational investment between age-based and kin-based societies.

[23] We focus on weight-for-height rather than any anthropometric measures normalized by age because the age of children in months was not recorded; below, in our analysis of Uganda's pension program where we have more comprehensive measures of anthropometry, we document the robustness of our findings across a range of possible parameterizations.

[24] Estimates of the relationship between the pension program and child nutrition are reported in table form in Table A11.

[25] Table A12 reports additional specifications, documenting that the distinction between age and kin-based societies is even starker focusing on male main providers, and that this pattern is restricted entirely to spending on education.



(a) WFH: Full Sample (b) WFH: Male Children (c) log Ed. Spending (d) log Share Ed. Spending

Figure 6: **Pension Grants and Investment in Children: Age Set vs. Kin.** Each sub-figure reports estimates of Equation (3); the left column reports ξ_1 and the right column ξ_2. The dependent variable is listed at the bottom of each graph. All specifications include interviewer fixed effects, age-by-ethnicity fixed effects, and the full set of baseline controls. Standard errors are clustered by sub-location and 95% confidence intervals are reported.

IV. Social Structure and National Policy: Uganda's Pension Program

The previous section exploited a randomized cash transfer experiment to document that age set societies have strong within-cohort economic ties, and comparatively weak kin-based ties. The latter finding was apparent in the context of the pension program treatment arm of the experiment, which led to substantial improvements in proxies for investment in children in kin-based societies and had no such effects in age set societies. Motivated by this finding, and the fact that the overall impacts of development policy can hinge on patterns of inter-generational ties and investment (Duflo, 2003; Ashraf et al., 2020), this section investigates the inter-generational consequences of Uganda's national pension program and how its effects differ in age set and kin-based social structures.

A. Setting

In 2011, Uganda introduced the Senior Citizen Grant (SCG), a social pension program targeting all individuals aged 65 and older.[26] The pension program pilot consisted of $7.50 USD monthly transfers, which corresponds to around 20% of average monthly per-capita consumption. Rather than introduce the program nationally, the government of Uganda piloted the program in just 15 districts; the set of pilot districts are displayed in Figure 7. This partial roll-out makes it possible to estimate the economic consequences of the program.

An explicit goal of the pension program was to improve the well-being of children, since the government of Uganda believed that pension recipients would invest part of the transfer in grandchildren. The website of Uganda's Ministry of Gender, Labour and Social Development, which was

[26]The age eligibility cut-off was 60 in the Karamoja region and we account for this throughout the analysis.

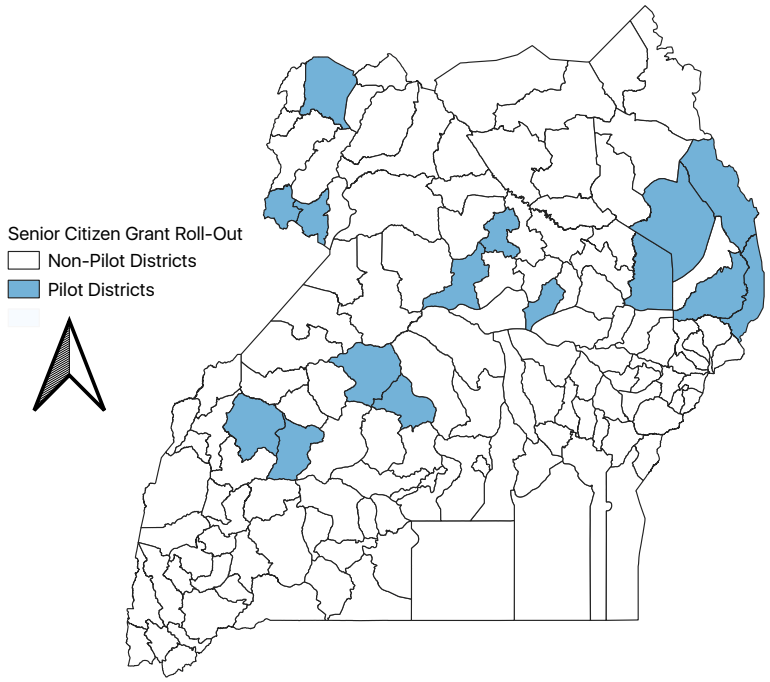


Figure 7: This map shows Uganda district boundaries and identifies in blue the set of pilot districts in the 2011 pilot program of the Senior Citizen Grant (SCG). There are 110 districts included in our baseline sample after linking district and ethnicity-level information to the DHS.

in charge of implementing the pension program, reads:

> Although the SCGs target older people, the grants benefit more than only the senior citizen beneficiaries. The SCGs have significant impact on development outcomes as *older people tend to invest a portion of their grant money in meeting their grandchildren's nutritional, health, education needs*.[27]

The staggered introduction of the pension program, combined with the widespread prevalence of age set organization in Uganda, makes it an ideal setting to study how social structure shapes intergenerational economic ties and the spillover effect of major national policy.

B. Data

The main data set for this analysis is Uganda's Demographic and Health Survey (DHS). Our primary analysis relies on the 2016 round of the survey; we also use the 2006 round of the DHS, which was conducted prior to the introduction of the SCG, to conduct a placebo exercise. For each household in the survey, the DHS reports information on household composition, including the age of all members, which we use to identify which households are exposed to the pension program. The survey also reports anthropometric data for all children under five years of age and schooling information for all school aged children, which are our proxies for investment in children.

All household members selected for the individual component of the survey report their ethnicity, which we match to the household data using unique household identifiers.Using self-reported

[27] See here: https://socialprotection.go.ug/senior-citizens-grants-scgs/. Accessed March 30, 2021.

ethnicity and a range of anthropological and ethnographic accounts, we determine whether age sets are the dominant social organization or not for as many ethnic groups as possible in the DHS sample; the details of this data collection process are discussed in Appendix A.1.[28] Members of age set societies comprise 29% of our sample.

Finally, we use the Ministry of Gender, Labour and Social Development website to identify the districts that were included in the SCG pilot program (displayed in Figure 7).

C. Estimation Strategy

C.1 Measuring Potential Pension Exposure

We construct a measure of "potential pension exposure" for all households in the sample, in both pilot and non-pilot districts. Our baseline potential exposure measure is:

$$\text{Potential Exposure}_h = \sum_{t=2011}^{2016} \left(\sum_{i \in h} \mathbb{I}_{iht}^{\text{Age65+}} \right) \tag{4}$$

where i indexes individuals, h indexes households, and t indexes years since 2011. $\mathbb{I}_{iht}^{\text{Age65+}}$ is an indicator that equals one if individual i in household h was at least 65 years old in year t; we construct this indicator for all individuals in every household using household member age data from the DHS. Thus, this instrument for pension exposure captures the number of years of pension grants each household would have received if its household composition observed in 2016 were fixed during the preceding years.

C.2 Empirical Model

In order to identify the effect of the pension program on children, we compare households with a given level of potential pension exposure across pilot and non-pilot districts. We conduct this comparison separately for households from age set societies and households from kin-based societies.

Mirroring our identification strategy for estimating spillovers in Kenya's HSNP, our strategy and results can be illustrated by a simple graph. In Figure 8, we report the partial correlation between $\text{PotentialExposure}_h$ and child weight-for-height across four sub-populations: (1) age set societies in non-pilot districts, (2) age set societies in pilot districts, (3) non-age set societies in non-pilot districts, (4) non-age set societies in pilot districts. If our empirical design is valid, we expect no relationship between potential pension exposure and child nutrition in non-pilot districts where pension grants were not delivered; this is what we find in columns (1) and (3). Moreover, consistent with our main hypothesis, we find no effect of potential pension exposure on child nutrition among members of age set societies in pilot districts (column 2), but a large positive effect of potential pension exposure on child nutrition among members of kin-based societies in pilot districts (column 4).

[28] We were able to definitively determine whether or not 85% of the households in the sample belong to an age set society. For the remaining 15%, either ethnicity was not specified, or there was insufficient secondary source information to make this determination with certainty. Most un-coded ethnic groups are small and comprise less than 2% of the population.

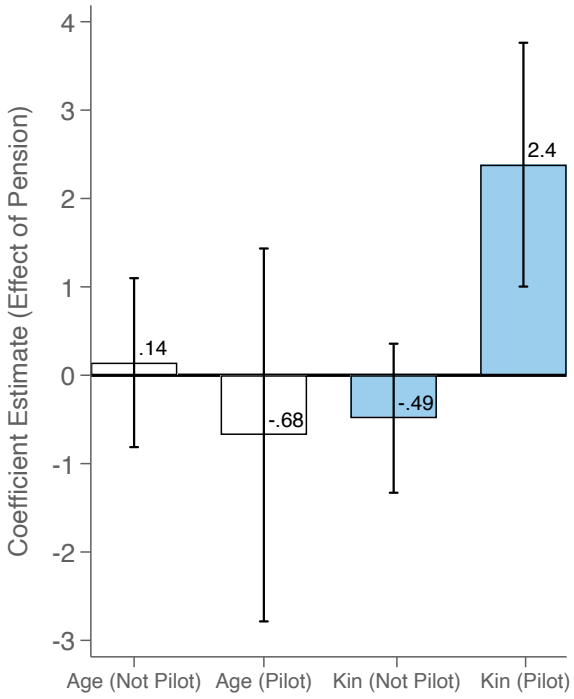


Figure 8: **Pension Exposure and Child Nutrition, Separately by Pilot Status and Social Structure** Each bar reports the coefficient estimate of the relationship between a child's weight-for-height percentile and PensionExposure_h. The regression is estimated on the sub-sample noted at the bottom. From left, these are: age set societies in non-pilot districts, age set societies in pilot districts, non-age set societies in non-pilot districts, non-age set societies in pilot districts. District-by-ethnicity and interview month fixed effects are included in all specifications. 95% confidence intervals are reported.

Our more general econometric model is:

$$y_{ih} = \beta_1 \cdot \left(\text{PotExp}_h \cdot \mathbb{I}^{\text{Pilot}}_{d(h)} \cdot \mathbb{I}^{\text{Kin}}_{e(h)}\right) + \beta_2 \cdot \left(\text{PotExp}_h \cdot \mathbb{I}^{\text{Pilot}}_{d(h)} \cdot \mathbb{I}^{\text{AgeSet}}_{e(h)}\right) + \alpha_{ed} + \mathbf{X}'\Gamma + \epsilon_{ih} \tag{5}$$

where h continues to index households and i indexes individuals. In the case of the main results, the sample is restricted to all children under 60 months of age (i.e. the sample for which anthropometric data were collected). $d(h)$ is the district in which the household is located and $e(h)$ is the household's ethnic group. PotExp_h is defined in (4). $\mathbb{I}^{\text{Pilot}}_{d(h)}$ is an indicator that equals one if a household is located in a pension pilot district, and $\mathbb{I}^{\text{AgeSet}}_{e(h)}$ and $\mathbb{I}^{\text{Kin}}_{e(h)}$ are indicators that equal one if a household is part of a kin-based or age-based ethnic group respectively. Standard errors are clustered by district.

Our hypotheses are that $\beta_1 > 0$ and that $\beta_1 > \beta_2$. That is, we hypothesize that transfers to older household members benefit children in kin-based societies—where inter-generational ties are present—and does so *more* than in societies with age sets—where inter-generational ties are weak. Our estimate of interest is $\beta_2 - \beta_1$: the differential effect of the pension program on child nutrition in societies without versus with age sets. Further, if inter-generational ties in age set societies are completely absent, we would expect to find that $\beta_2 = 0$.

One potential shortcoming of this analysis is that we only observe a child's exposure to older

family members if those older family members are in the same household.[29] Thus, our baseline estimates do not capture differences in inter-generational relationships in general but rather differences in inter-generational relationships within the household. While there are some exceptions, the exact parameter we estimate departs from most ethnographic work on the distinction between age-based and kin-based societies, which focuses on differences in inter-household ties; therefore, it can be thought of as a more extreme test of our motivating hypothesis.[30] In Section D, we also report estimates from the "double difference" analog to Equation 5 that does not exploit variation in pension exposure across households and instead estimates differences in the average effect of the pension program on child nutrition in age-based vs. kin-based societies.

C.3 Balance Tests

Our key identification assumption is that absent the pension program, differences between children in societies with and without age sets should be unrelated to pension exposure. To investigate the plausibility of this assumption, we estimate differences between households from societies with and without age sets in the non-pilot group. Results from this analysis are reported in Table A13. First, we show that there is no correlation between age set organization and measures of potential pension exposure and household composition. These variables are all measured at the household level (Panel A). Second, we show that there is no relationship between age set organization and our measures of child nutrition (Panel B). Average child age is also balanced across both groups, which suggests that children from the two groups are not differentially selected into our sample due to different rates of infant mortality.

A remaining possibility is that, even though age set organization is not correlated with child nutrition in control districts, pension program exposure (i.e., the presence of older household members) may be differentially correlated with child nutrition in age set societies in the non-pilot group. It would be a concern, for example, if in the control group, potential pension exposure is positively correlated with child health in kin-based societies but not age set societies. To test this directly, in Panel C of Table A13 we report the correlation between the interaction term between potential pension exposure and age set organization, and measures of child nutrition. The estimated coefficients are small and statistically insignificant in all specifications. Together, these findings suggest that it is unlikely that our results are driven by baseline differences between societies with and without age sets in either child nutrition or household composition, which could affect selection into pension exposure in ways that could bias the main estimates.

[29] The 2016 DHS survey from Uganda does not collect data on whether adults have living family members residing outside their household.

[30] Some ethnographic work describes how within-household arrangements also differ between age and kin-based societies. For example, Hodgson (1999) describes how members of Maasai households have rooms where visiting age-mates of the male head of household could stay. Women sleep in an inner room, while men would stay in an outer room, often with a visiting age mate. Gulliver (1958) describes how Turkana men live near several members of their age set and often participate in activities, including meals, with age set members rather than immediate family members. This could lead older individuals to be less tied to younger members of their family, even within the same household. Finally, Bohannan (1964) cites how members of the Tiv age set system are often more loyal to their age mates than to their own parents.

Table 4: Effects of Uganda's SCG on Child Nutrition in Societies With and Without Age Sets

Dependent Variable is the Weight for Height Percentile					
	(1)	(2)	(3)	(4)	(5)
		Full Sample		Males	Females
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Kin}}$	2.477	2.943	3.135	5.729	2.748
	(0.605)	(1.008)	(1.098)	(1.428)	(1.195)
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Age Set}}$	-0.649	-0.818	-0.933	-2.440	0.107
	(0.965)	(1.026)	(0.951)	(2.542)	(1.173)
Observations	4,112	4,107	4,107	2,020	1,976
R-squared	0.130	0.131	0.203	0.240	0.241
District x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Interview Month FE	Yes	Yes	Yes	Yes	Yes
Age Set x Potential Exposure FE	No	Yes	Yes	Yes	Yes
Age in months x Gender FE	No	No	Yes	Yes	Yes
p-value, $\beta_1 = \beta_2$	0.006	0.009	0.007	0.008	0.122
Mean Non-Pilot	49.054	49.054	49.054	49.054	49.054

Notes: The unit of observation is the child. The sample includes all children in the 2016 round of Uganda's DHS who are less than 60 months old. The dependent variable is the percentile of the weight-for-heigh distribution. Potential Exposure is constructed as in Equation 6. $\mathbb{I}^{\text{Pilot}}$ is an indicator variable that equals one if the household is in a pilot district. $\mathbb{I}^{\text{Age Set}}$ is an indicator variable that takes value one if the household belongs to an age-based society. $\mathbb{I}^{\text{Kin}}$ is an indicator variable that takes value one if the household belongs to kin-based society. Standard errors are clustered at the district level.

D. Main Results

Our main finding is that household exposure to the pension program improved child nutrition in societies without age sets, but had *no impact on child nutrition in societies with age sets.* Interpreted through the lens of our empirical framework, this suggests that inter-generational ties in age set societies are sufficiently weak that an income shock to the grandparent generation has no discernible impact on child well-being.

Our baseline estimates of Equation (5) are reported in Table 4. Following Duflo (2003), we use child weight-for-height as our baseline anthropometric dependent variable, but show below that the findings are similar using alternative metrics. In column 1, we control only for ethnicity-by-district and interview month fixed effects. β_1 is positive and significant, suggesting that household pension exposure improved child nutrition in kin-based societies. However, β_2 is statistically indistinguishable from zero, and is significantly smaller than β_1 (p-value$=$ 0.006). An additional year of pension receipt in a household without age sets, compared to one with age sets, increases child weight by roughly 0.15 standard deviations and reduces the likelihood that a child is malnourished by roughly 5.5%.[31] The large, positive effect of the pension program on child nutrition in kin-based societies in our sample is completely absent in age set societies.

In the remaining columns, we add an additional set of controls and fixed effects and the estimates

[31]The estimated effect sizes for kin-based societies are comparable to other estimates from the literature. Duflo (2003) finds that South Africa's pension program increased weight-for-height of girls by 1.19 standard deviations. The pension program she analyzed entailed monthly transfers which corresponded to approximately 248% of average income, and she estimated the effect of receiving approximately one year of pensions. If effects on weight-for-height are linear, then our results correspond almost exactly to her findings.

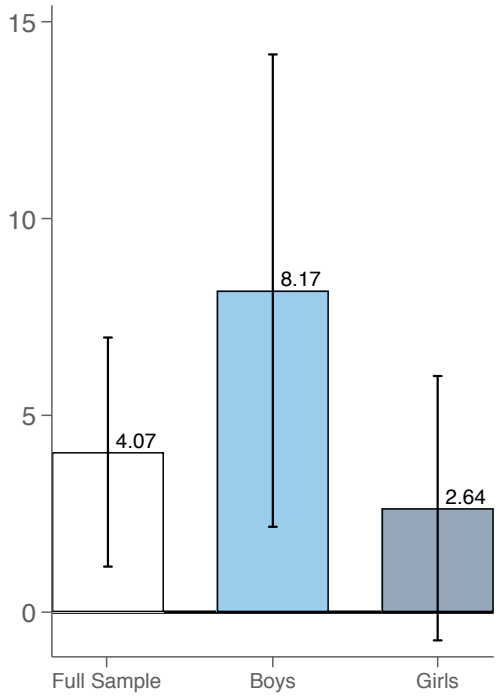
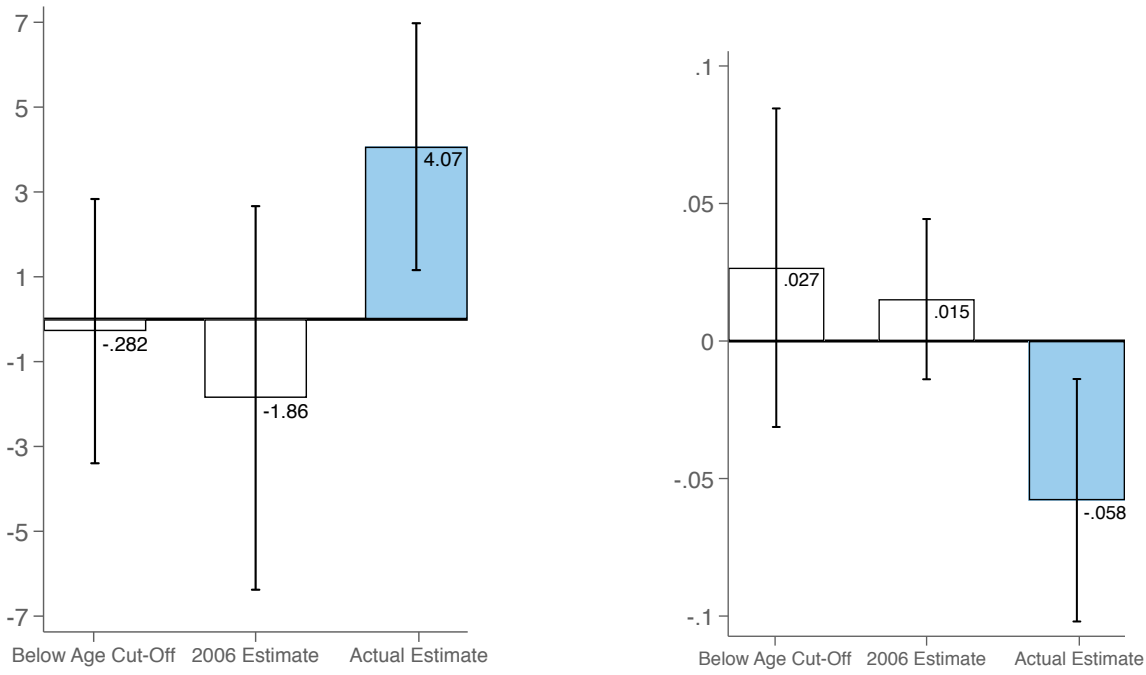


Figure 9: **Effect of Pension on Children's Weight-for-Height Percentile in Kin vs. Age Set Societies.** Each column reports the differential effect of pension exposure on households from kin-based vs. age-based societies ($\beta_1 - \beta_2$ from Equation 5). Moving from left to right, the sample in each specification includes (i) all children under six, (ii) male children under six, and (iii) female children under six. The dependent variable is the child's weight-for-height percentile. Standard errors are clustered by district and 95% confidence intervals are reported.

remain very similar. In column 2, we include potential pension exposure fixed effects interacted with the age set indicator, thus flexibly absorbing any differences between societies with and without age sets in potential pension exposure and household composition. In column 3, we add age-by-gender fixed effects. In both cases, the estimates are similar and if anything, increase in magnitude. In columns 4-5, we investigate the effect for male and female children separately. While we find qualitatively similar results for both, the magnitude is larger for male children, consistent with existing evidence that a disproportionate share of household resources is often invested in boys (Duflo, 2003; Milazzo, 2014; Barcellos et al., 2014). Our estimates of $\beta_2 - \beta_1$ from the specifications in columns 3-5 are reported in Figure 9, and are statistically significant (p<0.01) for the full and all-male samples.

Falsification Tests To make sure that our estimates capture the causal effect of the pension program, we report two sets of falsification tests, reported in Figure 10. In Figure 10a, the dependent variable is the child's weight for height percentile and in 10b it is an indicator if the child is in the bottom 5% of the distribution.

First, we investigate the effect of having household members who are *just below* the age cut-off for the pension program on child nutrition. Any unobservables that lead certain households to have more older members—and any difference between age set and kin-based societies in the inclusion of



(a) Weight-for-Height Percentile

(b) Weight-for-Height Bottom 5% Indicator

Figure 10: **Falsification Tests.** The left column of each figure reports the differential effect of *having members aged 55-65* on households from societies without vs. with age sets. The center column of each figure reports the differential effect of *pension exposure measured in 2006* on households from societies without vs. with age sets ($\beta_1 - \beta_2$). For comparison, the right column of each figure reports the differential effect of actual pension exposure on households from societies without vs. with age sets. In Figure 10a the dependent variable is the child weight-for-height percentile and in Figure 10b it is an indicator if the child falls in the bottom 5% of the distribution. Standard errors are clustered by district and 95% confidence intervals are reported.

older members in the household—would likely also affect the presence of older individuals just below the cut off. However, since these individuals do not receive the pension, if our estimates capture the causal effect of the pension program their presence should have no impact on child nutrition. We compute this placebo measure of exposure to household members just below the cut-off following Equation 4, except rather than count household members over age 65 in year t, we count household members who would have been aged 55-64 in year t. Our estimate of the differential effect of this placebo exposure measure on child nutrition in societies without versus with age sets ($\beta_2 - \beta_1$) is reported in the leftmost columns of Figure 10a and 10b; in both cases, we find no significant effect of our placebo measure and, if anything, the sign is the opposite of our baseline estimates.

Second, we show that our results are not driven by pre-existing trends—the patterns we observe are entirely absent prior to the introduction of the pension program. In particular, we estimate Equation (5), defining pension exposure exactly as in Equation (4) but using data from the 2006 round of the DHS, prior to the introduction of the pension pilot.[32] The differential effect of pension exposure

[32]One downside to this analysis using the 2006 round of the DHS is that this round does not ask household members for their ethnicity; instead, it asks for the language they speak at home. While it is straightforward to link languages to ethnic groups, the language information is more aggregated and so we are left with only six languages of which one corresponds to societies with age sets. This feature of the data could also explain the relative imprecision of these placebo estimates.

in 2006 on child nutrition in societies without versus with age sets ($\beta_2 - \beta_1$) is reported in the middle column of Figures 10a and 10b. In both cases we find no significant effect of this second placebo measure and again, if anything, the sign is the opposite of our baseline estimates.

Finally, for comparison, the rightmost column of Figures 10a and 10b reports our baseline (actual) estimates of $\beta_1 - \beta_2$.

Sensitivity Analysis: Measurement and Controls We report a range of additional estimates that probe the sensitivity and robustness of our baseline findings. First, we show that the findings are very similar using alternative measures of potential pension exposure. The first alternative measure estimates pension exposure only during the survey year, and does not use the household age distribution to retroactively estimate pension receipt in prior years, and the second exploits variation in child age to estimate a more precise proxy for child level exposure. These estimates are described in Appendix Section B.2 and reported in Table A14.

Second, we document that the results are very similar after including a broad range of controls. We document that the results are robust to controlling for several proxies for household composition and household wealth, as well as interviewer fixed effects. We also show that the findings are similar after controlling for several ethnicity-level characteristics; to account for an ethnicity-level characteristic $Z_{e(h)}$, we include controls of the form $\text{PotExp}_h \cdot \mathbb{I}^{\text{Pilot}}_{d(h)} \cdot Z_{e(h)}$ along with all single and double interactions. These estimates are described in greater detail in Appendix Section B.3.

Sensitivity Analysis: Inference Our estimates exploit differences in social structure across ethnic groups in Uganda, and our main sample consists of twenty-five groups. Given the relatively small number of groups, we also conduct inference using re-sampling procedures. As in the analysis of Kenya's HSNP, we generate placebo categorizations randomly assigning each group to either the age-based or kin-based group, both with and without replacement. We compute our estimates of $\beta_1 - \beta_2$ for each placebo assignment and estimate the p-value as the share of placebo estimates larger than our baseline estimates. The full distributions of placebo coefficients, as well as our actual estimates marked with a dotted line, are reported in Figure A10. Using the bootstrap, we estimate that $p = 0.024$ for our baseline estimate (column 1 of Table 4), $p = 0.024$ when we include the full set of controls (column 3 of Table 4), and $p = 0.072$ when we restrict the sample to boys (column 4 of Table 4). Using randomization inference, the p-values are $p = 0.000$, $p = 0.000$, and $p = 0.107$ respectively; in the first two cases, none of the placebo estimates are larger than our actual estimate.

Alternative Strategy: Double-Difference Estimates We next show that the results are qualitatively similar if we *do not exploit variation in household-level pension exposure at all*. A potential shortcoming of our baseline specification (Equation 5) is that it could be biased if the introduction of the pension program induces differential endogenous changes in household composition between members of societies with and without age sets. There are several reasons why this form of selection should not be a major concern, described in Appendix Section B.4. Nevertheless, to investigate whether our findings are driven by our measured variation in household composition, we present estimates from

an alternative specification that only exploits district and ethnicity-level variation, and hence does not depend on household composition at all. These double-difference estimates simply capture the average difference in health outcomes between children from age set vs. kin-based societies, in pilot vs. non-pilot districts. The details of the estimation are described in Appendix Section B.4, and the main results are reported in Figure A9. Consistent with our main findings, children in kin-based societies (compared to age set societies) are higher on average in the weight-for-height distribution and relatively less likely to be malnourished where the pension pilot was introduced.

E. Additional Outcome Variables

E.1 Alternative Measures of Child Nutrition

In Table A16, we investigate the impact of the pension program on a range of additional anthropometric measures. For comparison, column 1 reports the specification in column 3 of Table 4. First, we document that the result is very similar using the weight-for-height z-score (instead of percentile) as the dependent variable (column 2). Second, we show similar results when the dependent variable is an indicator that equals one if the child is below the 5th percentile in the weight-for-height distribution, a common cut-off used by the Centers for Disease Control (CDC) to define malnourishment (Mei et al., 2008; Philips and Shulman, 2018). Age set organization affects not only the impact of the pension program on where a given child falls in the full health distribution but also its impact on the probability that they are extremely malnourished. Third, we document that all findings presented thus far are robust using the weight-for-*age* distribution rather than the weight-for-height distribution (columns 4-6).

Fourth, we show that the results are qualitatively similar but smaller in magnitude and statistically imprecise using the *height*-for-age distribution (columns 7-9). Measurable changes in child height are only affected by persistent and prolonged patterns of consumption (Hoddinott et al., 2013; Jayachandran and Pande, 2017); the average number of years of pension exposure in our sample is 1.9 making it unlikely that the pension program would affect child height by the year of data collection.[33] While the pension program may not be prolonged enough to affect the older children in our sample, one possibility is that young children, who have lived most of their lives since the introduction of the program, are nevertheless affected. To investigate this possibility, we include an additional interaction between our main independent variables and an indicator that equals one if the child is below two years of age, roughly the average years of pension exposure in the sample. These estimates are reported in Table A17 and indicate that the pension program does seem to affect the height of the youngest children in kin-based societies, while again having no effect in age set societies.

Finally, we construct an index incorporating all nine measures of child nutrition by computing their first principal component.[34] Using this index as the dependent variable, we find a strong, pos-

[33] Our findings are consistent with Cahyadi et al. (2018), who find no effect of cash transfers on stunting after two years of a conditional cash transfer program, where stunting is defined as being two standard deviations less than the WHO's height-for-age standard. Indeed, most analyses of cash transfer programs find no evidence of an impact on child height, especially in the short term (Baird et al., 2019; Cahyadi et al., 2018, p. 17).

[34] Intuitively, the first principal component loads positively on all percentile and z-score measures and negatively on all indicators for being in the bottom 5% of the distribution (see Table A18).

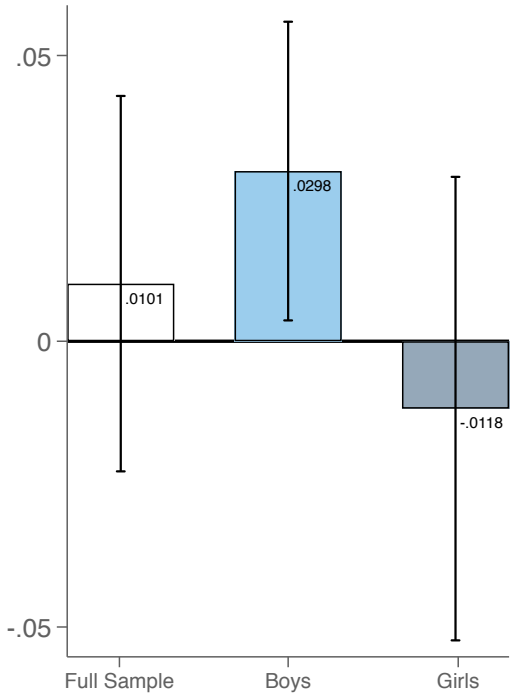


Figure 11: **Effect of Pension on Primary School Attendance in Kin vs. Age Set Societies.** Each column reports the differential effect of pension exposure on households from kin-based vs. age-based societies ($\beta_1 - \beta_2$ from Equation 5). Moving from left to right, the sample in each specification includes (i) all children 6-14, (ii) male children 6-14, and (iii) female children 6-14. Coefficient estimates and 95% confidence intervals are reported.

itive effect of pension exposure in societies without age sets and no effect on societies with age sets (difference p-value $= 0.0137$).

E.2 School Attendance

We finally investigate the impact of pension exposure on the school attendance of primary school age children. While the DHS does not report spending on education, it does report whether school age children actually attend school or not. This is a far cruder proxy for investment in children than either spending on education or child nutrition, since it only captures an extreme extensive-margin decision about whether the child should attend school or not. Nevertheless, Figure 11 reports the differential effect of pension exposure on the primary school attendance of children from kin-based vs. age-based societies ($\beta_1 - \beta_2$). The findings mirror our results on the nutrition of young children, except here the findings are strongly driven by male children (middle column). An additional year of pension receipt increases the likelihood that a primary school age boy is in school by roughly 3% in kin-based societies, compared to age-based societies.

Table A19 reports the full set of regression estimates and shows that the effect is driven by a positive and significant effect of pension exposure on school attendance of boys in societies without age sets, and zero effect in age set societies. However, pension receipt does not affect the school

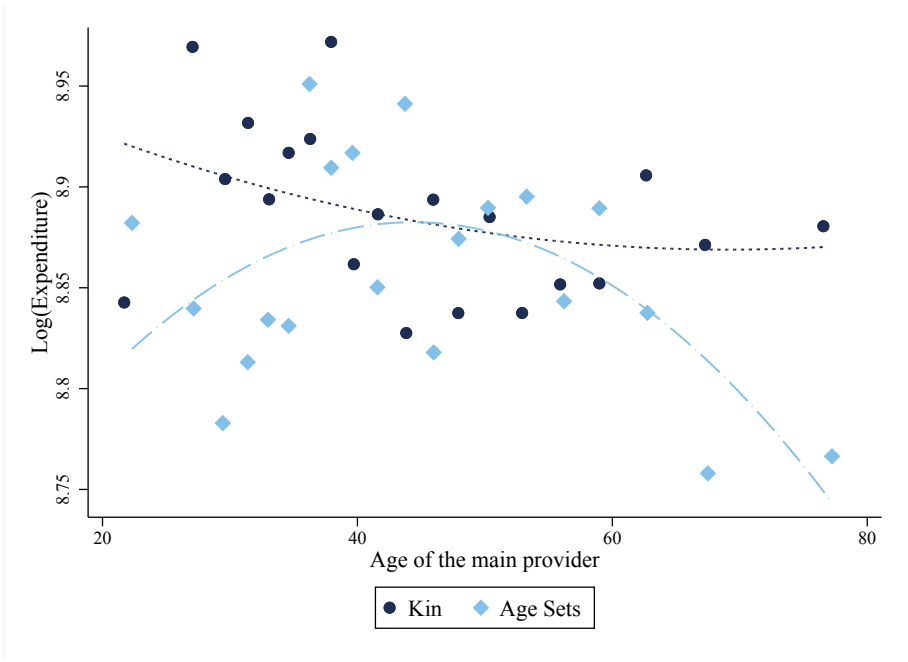


Figure 12: **Consumption Over the Lifecycle: Age Set vs. Kin.** Binscatter plots of log of household consumption expenditure (y-axis) vs. the age of the main provider (x-axis), separately for members of age set societies (black circles) and kin-based societies (gray diamonds). Quadratic fit curves are also displayed. We partial out sub-location fixed effects and the number of household members.

attendance of girls in either set of ethnic groups. Given that in our sample most of the ethnic groups are patrilocal, and none are matrilocal, this finding is consistent with Bau (2021) who, in Ghana and Indonesia, finds that grandparents tend to invest in the education of children that will co-reside with them as adults. Appendix B.5 further investigates effects on older children, aged 15-18, focusing on both secondary school attendance and teenage marriage.

V. Discussion: How Culture Shapes Inequality and Vulnerability

This paper's findings show that local social structure shapes financial networks; income shocks and public policy propagate through the local economy in vastly different ways across ethnic groups. The distinct set of economic ties that exist in kin-based compared to age set societies suggests that social structure could also be an important determinant of the pattern of cross-sectional inequality. It could also imply that the two forms of social organization are well positioned to weather very different types of economic shocks and overcome distinct economic challenges.

In age set societies, we find that financial ties are strongest within the age cohort. Since individuals rely disproportionately on their own age cohort for economic support, people at low-earning parts of the lifecycle could be left systematically worse off. The young and the old, for example, must rely (largely) on other members of their own age cohort, who have similarly low income-earning potential. In kin-based societies, however, where individuals are likely to have strong connections to people at all stages of life, inequality over the lifecycle could be lower. For example, older individuals can rely on younger generations and young people can rely on older generations.

A very different pattern, however, may exist across family lineages or clans. In kin-based societies, where resources are kept to a larger extent within the extended family, certain clans may accumulate substantially more wealth and opportunity than others. Positive and negative shocks alike propagate through the extended family. In age set societies, where age sets cut across lineage, this form of inequality could be more limited since the age set system links individuals in different families.

To investigate this set of hypotheses about the structure of inequality, we return to our baseline consumption data from the HSNP survey in Kenya. Figure 12 reports total consumption expenditure for male main providers across age cohorts, separately for societies with and without age sets. Consistent with our conjecture, old and young members of age set societies consume systematically less, while the evolution of consumption over the life cycle in kin-based societies is comparatively flat. This difference in consumption patterns is statistically significant, as documented in Table A21, and does not seem to be driven by differences in *income* over the lifecycle in societies with and without age sets.[35] The combination of this finding with the main results of the paper indicates that the preeminence of financial ties within the age cohort in age set societies generates less consumption smoothing over the lifecycle and relatively less consumption on average in old and young ages.

Our hypotheses also suggest that while there is greater inequality across age cohorts in age set societies, there could be systematically *less* inequality across extended families or clans. Figure 13 reports the average consumption spending of all households in each sub-clan, separately for members of age set and kin-based societies. Sub-clans are ordered within the age set and kin-based groupings based on the average level of consumption. Consistent with our conjecture, the figure shows substantially less consumption inequality across sub-clans in age set societies. The pattern for age set societies is relatively flat, while in kin-based societies there are large consumption differences across clans, particularly those at the far left and far right ends of the figure. To put the magnitude in perspective, the standard deviation of consumption across sub-clans is 60% larger in kin-based societies compared to age set societies; the inter-quartile range (75-25) of average consumption across sub-clans is 2870 KSh in age set societies and 5594 KSh in kin-based societies, corresponding to 56% of the in-sample average annual income.

Together, these findings indicate that the two forms of social organization lead to very different patterns of inequality and are likely well positioned to withstand different forms of hardship. Shocks or forms of economic hardship that affect specific age cohorts could be more challenging to withstand in age set societies. These may include conflict (which affects predominately young men); diseases that disproportionately affect specific cohorts (HIV in the case of the young and COVID in the case of the old); as well as the fact that, as discussed above, the young and the old have less access on average to income earning opportunities. On the other hand, shocks to specific locations or lineages could be harder to weather in kin-based societies. These may include the bankruptcy of a family firm or farm; adverse weather conditions in a particular region; divorce and lineage-based feuding; or the out-migration of younger members of the group, leaving few people to take care of older members

[35] We estimate the relationship between (log of) income and age and age^2, separately for kin-based and age-based societies. We find no evidence of a heterogeneous relationship between age and earned income for societies with vs. without age sets. The coefficients on the interaction terms between the age set indicator and age and age^2 respectively are -0.00314 (0.00378) and 0.00001 (0.00006).

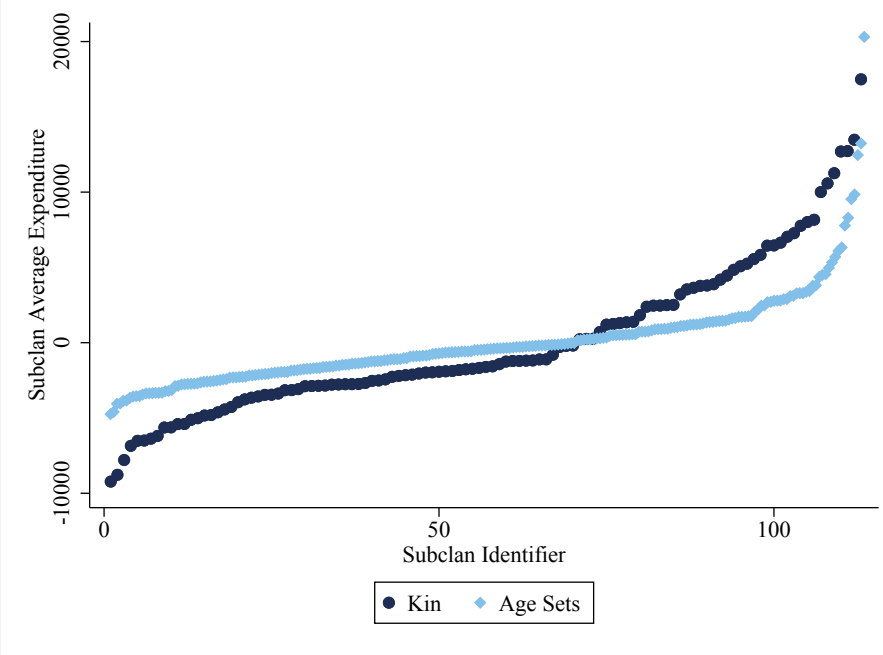


Figure 13: **Consumption Across Sub-Clans: Age Set vs. Kin.** Scatter plot of consumption expenditure (y-axis) vs. sub-clan identifier (x-axis) where sub-clans are ordered by their average consumption spending within the set of kin-based and age-based ethnic groups. The graph is plotted separately for members of age set societies (gray diamonds) and kin-based societies (black circles). The y-axis measures average expenditure across all households within each sub-clan.

of the family. The dynamic impacts on wealth accumulation of these two forms of network structure could also be very different. Inequality across clans can grow over time, which might have adverse consequences, including the accumulation of political inequality and coercion of poorer subclans. The lower bequest motives in age set societies, however, as evidenced by the absence of investment in children in either of the two pension programs that we analyze, could lead to less inter-generational accumulation across the board. We leave these implications of social organization to future work.

Methodologically, our results suggest that a deeper understanding of social structure, and anthropological analyses thereof, could be a useful complement to direct network measurement by making it possible to proxy the structure of social networks in contexts where direct measurement is impossible or prohibitively costly. This is especially important in light of mounting evidence that network structures play a key role in analysis of risk sharing and development policy (Breza et al., 2019). Using our reading of existing ethnographic work to identify age set organization, we were able to predict where particular social ties would be strong and weak, and hence how both Kenya's cash transfer program and Uganda's pension program would propagate through the economy. We were also able to predict which segments of the population would be most vulnerable on average. The approximation that our method provides could be useful for policy analysis and design, especially for large-scale programs or in more remote areas where network data collection is not an option.

VI. Conclusion

This paper documents that social structure predictably shapes patterns of economic interaction, informal redistribution, and the impact of public policy. A rich ethnographic literature suggests that local differences in social structure, and in particular the distinction between age-based and kin-based social organization, are important for financial transfers. In age set societies, individuals are organized into age-based social groups and an individual's relationships with his "age mates" often take priority over family ties. Yet despite the prevalence of age set organization in sub-Saharan Africa and around the world, its economic implications have not been studied quantitatively.

To investigate these ideas, we collect information from a broad range of ethnographic sources on the social structure of ethnic groups comprising the majority of the population of Kenya and Uganda. Exploiting unique features of a cash transfer experiment in Kenya, we first document that in age set societies there is strong evidence of within-cohort financial ties and zero evidence of within-clan financial ties or inter-generational investment within the family. In kin-based societies we observe the opposite pattern. Second, analyzing the introduction of Uganda's national pension program, we show that pension grants have large, positive spillover effects on child nutrition in kin-based societies, but no effect in age set societies, where financial ties across generations are weaker. Local social structure leads to strikingly different distributional consequences of public policy, suggesting that insights from anthropology about variation in local financial networks could inform economic and policy analysis.

Age set organization is one example of the vast differences in social structure that exist around the world, and of how patterns of allegiance and economic exchange may vary widely across contexts. Other examples include secret societies, cults and religious groups, gender-based groups, military associations, and clan super-sets that link individuals across broad geographic expanses. While our analysis focuses specifically on age sets, our findings suggest that existing descriptions of social organization could be important for better understanding and predicting differences across contexts in patterns of economic exchange. Exploring additional features of social organization and how they shape modern financial networks, inequality, and the heterogeneous effects of public policy strikes us as an exciting area for future work.

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Online Appendix

for "Age Set vs. Kin: Culture and Financial Ties in East Africa"

by Jacob Moscona and Awa Ambra Seck

Contents

A Data: Sources and Variable Construction **44**

A.1 Identifying Age Set Societies 44

A.2 Other Ethnicity-Level Characteristics 63

A.3 Ethnicity-Level Correlates of Age Set Organization 64

A.4 Hunger Safety Net Program (HSNP) Evaluation 65

A.5 Uganda's Demographic and Health Surveys (DHS) 66

A.6 The Population of Age Set Societies 66

B Detailed Description of Supplementary Results **68**

B.1 Kenya's HSNP: Additional Controls 68

B.2 Uganda's Senior Citizen Grant: Alternative Pension Exposure Measures 69

B.3 Uganda's Senior Citizen Grant: Additional Controls 69

B.4 Uganda's Senior Citizen Grant: Estimates that do Not Exploit Household Exposure . 70

B.5 Uganda's Senior Citizen Grant: Older Children 71

C Supplementary Figures and Tables **73**

A. Data: Sources and Variable Construction

A.1. Identifying Age Set Societies

Here we describe our coding of social organization. Information on the presence of age set organization is not available from standard ethnographic databases for Africa, including Murdock (1967)'s *Ethnographic Atlas*. Therefore, for our sample of ethnic groups in both Uganda and Kenya, we used a broad range of ethnographic work to determine whether or not age sets were the dominant form of social organization. The presence of age set organization was determined using the canonical definition from Radcliffe-Brown (1929), described in the main text.

The full list of ethnic groups in our analysis is displayed in Tables A1, A2 and A3, along with whether or not we classified each group as an age set society and the source(s) used to make the classification. Table A1 lists the ethnic groups in our sample for the analysis of the Hunger Safety Net Program (HSNP) in Northern Kenya. For 99.82% of the sample we were able to determine whether the household is a member of an age set society or not. In the HSNP data, unlike the DHS, language rather than ethnicity is reported. The only language in the sample that is not immediately straightforward to link to a particular ethnic group is Swahili, which is the home language of 0.18% of the

sample. Table A2 lists the ethnic groups in our sample from Uganda. We were able to verify whether or not age set organization was the dominant form of social organization for 85% of the sample. The majority of the remaining ethnic groups are small—each under 2% of the DHS sample—and we were not able to find sufficient information to determine whether or not age sets are present. Finally, Table A3 lists the ethnic groups in Kenya's DHS that we classified in order to construct Figure 1 of the main text and that were not included in Table A1. The Somali, Turkana, Samburu, Borana, Gabra, and Rendille are also in the DHS; the source material corresponding to those groups is in Table A1.

Here, we explain the coding of each group included in each part of our analysis. To code an ethnicity as an age-based group, we required evidence that age sets are present and a prominent form of social organization. In many cases, we also include explicit mentions of solidarity within age sets, as well as descriptions of the initiation ritual(s) that bond members of an age set together into a lifelong corporate group. To code an ethnic group as a kin-based group, we required descriptions of kin, clan, or lineage-based social organization. For many groups, the absence of age sets was mentioned explicitly; when this is the case, we make note of it. In other cases, we inferred that groups did not have age sets if an extensive description of their social organization was provided and age sets were not mentioned. Whenever we do not have enough information to determine conclusively if a group is age-based or kin-based, we exclude it from the analysis.

A.1.1 Groups Included in the Analysis of Section III (Kenya's HSNP)

Borana The Borana have a well defined system of age sets, which operate alongside the presence of broader generation-level groupings, known as "generation sets." Legesse (1973) notes that all Borana males have a position in the age-based system and "members of each class are recruited strictly on the basis of chronological age" (pp. 50-51). Tagawa (2017) also describes the age set system of the Borana; members of the same age set, who are "approximate coevals," are referred to as age mates and are initiated at the same time. Participants in each initiation are referred to as "children of kuuchu" and initiation takes place during the late teens or early twenties (pp. 19-20). Each age set is also part of a broader age grade, each of which has a unique name and is associated with a particular level of authority (pp. 16-18). While women also are members of age grades, they are not formed into narrower age sets based on their chronological age.

Burji The Burji are organized in a lineage-based system; while they have a system that divides individuals into generations ("generation sets"), there are no age sets. Hermann and Schubert (1970) describe the lineage-based system of the Burji and explicitly note the absence of age sets in Burji society, which they argue is surprising given the presence of generation sets and the fact that generation sets are often accompanied by age sets (pp. 51-59). Debelo (2012) also described the lack of age-based organization: "[A]ge itself is not significant in terms of categorization" (p. 524).

Gabra The Gabra have a well-defined system of age sets and members of individual age sets are initiated into the group at the same time. Age set membership is associated with a sense of common identity and shared allegiance. Tablino (1999) discusses the corporate unity between members of the

same age set; he writes, "A man does not take a status within the society as an isolated individual but as a member of a set of peers who assume responsibilities together" (p. 63). There are also rituals commemorating transitions between age grades: "No luba [age group] can come into being and no luba can pass from one grade to another unless the transitional ceremony is held. Therefore, the members of a luba are brought together and then held together by a ritual act" (p. 63). Shun (1984) also describes the age set system of the Gabra, and notes that it is most closely related to that of the Borana and Rendille (described above and below).

Garre The Garre have a clan-based social structure. Turton (1975, p. 253) argues that the Garre, which originated as an off-shoot of the pre-Hawiya Somali, are organized into a segmentary lineage system in which clan identity is of upmost importance. Schlee (1985, p. 19), in a broader analysis of social structure of ethnic groups in Northern Kenya, does not note any evidence of age-based organization among the Garre (despite discussing it while describing other groups that do have age-based organization) and instead argues that the Garre are a good example of strict lineage and clan-based social organization.

Rendille The Rendille have a well-defined age set system described by Beaman (1981), Spencer (1973) and Stewart (1977). Beaman (1981) describes the "intricate age-set system" of the Rendille; she explains that, despite having many unique components, the system is similar to that of the Samburu (see below) and organizes boys into discrete groups based on their chronological age that are formed during a circumcision ritual (pp. 360-376). Shun (1984) describes the circumcision ritual and the process through which age set bonding takes place: "Eligible boys are collectively circumcised together...by elders. [...] After circumcision, each initiate forms five kinds of bond friends within the first few months. [...] During this period, the initiates may exchange or share certain items and adopt reciprocal terms of address which they retain throughout life instead of their personal names" (p. 49). Handley (2009) notes that when men are asked their age they instead report the name of their age set, and that age groups gather together frequently; for example, when young men are in the warrior life stage, the elders gather each young age set together every month in order to teach and advise them.

Samburu The Samburu have a well-defined age set system. Each age set is formed with an initiation ceremony and remains a key determinant of social ties and obligations throughout an individual's life. Boys are circumcised upon becoming a moran [age-mate] and entering an age set (Spencer, 2012 p. 92). Spencer (1973) refers to the age set system as among the "purer, more extreme form[s]" of age set organization that have been documented. Individuals are most strongly bonded to members of their age set. Handly (2009) writes, "The group of morans [age mates] are the ones who have more responsibilities to each other, and they are bound more to their fellow moran than they are to their brothers or sisters."

Somali The Somali are organized in a rigid clan-based structure that is characterizes by Lewis (1961) as a segmentary lineage system. Branching lineage segments determine the set of social responsibilities and allegiances of each individual. Individuals are even quick to come to the aid of fellow

lineage members in feuds with other members of the broader Somali group, and allegiance to the lineage segment is paramount. Lewis (1991) writes that the "segmentary structure" frequently leads to the mobilization of "large swaths of the lineage system" in conflict because members of lineage segments come to the defense and aid of fellow lineage-members (p. 232). Beaman (1981, p. 367) explicitly states that age set organization is absent among the Somali and that there is no form of age-grading whatsoever.

Turkana The Turkana have a well-defined age set system in which boys are initiated during their late teenage years along with their age set group. Gulliver (1958) describes the initiation process, "Turkana youths are initiated into full formal adulthood at an average age of eighteen; the age limits vary in practice between about fourteen and twenty years. Initiation occurs by the youth spearing a male, castrated animal-ox, camel, goat, or sheep-at a communal ceremony which may last for several consecutive days or which may be renewed for a day or so at a time over a longer period" (p. 900). Gulliver (1958) further explains that the age set system determines each man's place in the social structure; he writes that " the system allocates to a man his membership in a group of coevals, gives him a placement in that group, and thus a determinate status in relation to all other men in the tribe" (p. 917). He continues, "[A]lways there will be some age-mates in [each man's] neighborhood who will combine with him in social activities. Moreover, they combine in certain essentially masculine activities such as feasting, dancing, ritual, and, formerly, warfare." Handley (2009) describes the solidarity that forms within each Turkana age set: "[T]hose who are rich and those who are poor [in the age set] come together so that they may share milk, meat, tea, sugar, etc. so it puts everyone as equal. [I]t is then that you can't differentiate between rich and poor because they are covering each other. Bonding within the age set helps because the morans [age mates] can rely on each other even if you have no money or social problems."

A.1.2 Groups Included in the Analysis of Section IV (Uganda's Pension Program)

Acholi The Acholi have a prominent age set system. Butt (2017) writes that there is a "well-defined system of age classes" in which initiation takes place "when boys are about 15 year old" (p. 86). There is a major initiation ceremony that involves a series of complex rituals and a period of isolation. Whitmire (2013) writes that "[t]he elders would escort boys ages sixteen to eighteen to the grazing grounds. The elders sang a warrior song while beating the boys. The boys would then kill a number of goats for the elders. Once they ate, the elders allowed the boys to eat. This practice continues today as well. Age-sets, then, were a crucial part of integrating young men into society" (p. 38).

Alur The Alur do not have age sets and are organized on the basis of clans; their social structure is sometimes referred to as a "segmentary state,"' a term coined by Southall (2004). Butt (2017) describes the social structure of the Alur based on clans and lineages, and age sets are not mentioned. She writes, "One particular clan seems to be associated with each tribe or tribal segment...clans are localised, each forming a geographical unit and consequently may be considered as identified with the tribe or tribal segment. As such they form the basis of the social and political organisation" (p.

175). Furthermore, Southall (2004, p. 166) notes, "There is no trace of any age set organization even to the extent of names for initiation sets."

Baganda The Baganda do not have age sets and are organized based on a clan structure. McClusky (2013, p. 257) writes that age organization is "absent" among the Baganda. Fallers (2017) describes the clan-based social structure of the Baganda in depth: "The Ganda were organized into patrilineal clans (bika, sing, kika), each with a major and a minor totem. A clan was known by the name of its major totem: for example, the Grasshopper clan or the Buffalo clan. Roscoe listed 36 clans; others have counted between thirty and forty, depending upon the interpretation of marginal cases. But it is clear that a relatively fixed number of clans was characteristic in Buganda [...] Observance of common taboos, knowledge of common history, remote common origin and a common ancestor and participation by the clan in political and court functions at the capital gave the clan a sense of unity, but from an individual's point of view the sub-clan (ssiga, pi. massiga) was much more immediate. This unit was further divided into lineages (mutuba, pi. mituba) and sub-lineages (lunyiri, pi. nyiriri)" (p. 52).

Bagisu The Gisu do not have age sets; instead, the lineage system is the main social form. La Fontaine (2017) notes, "[C]eremonies did not group boys into any formalized system of age-sets on which the military or political organization was based" (p. 42). Instead, the lineage system is described as an important basis for social organization: "Membership of a lineage determines the political and jural status of a Gisu man and defines the territorial unit within which he has the right to inherit or own land. Although not all political relations between villages or even between larger units were conceived of in terms of lineage relations, the lineage system formed a framework for the political organization" (p. 24). De Wolf (1980) further confirms that the Gisu "did not have" an age set system (p. 308).

Bakiga The Kiga do not have age sets and their social organization is primarily based on kinship. Taylor (2017) makes no mention of age set organization, but describes the kinship system in depth: "The individual Kiga is set in a nexus of different kinship affiliations, many of which involve important patterned attitudes and obligations. In addition to patrilineal connections, which are the most important in group organization, there are affinal ties across the divisive clan lines, close bonds with the maternal lineage and frequent pacts of pseudo-kinship or blood-brotherhood" (p. 118). There is strong solidarity between kin groups: "Groups of closely related households—for example, brothers and brothers' sons—form what Edel calls the patriarchal lineage. [...] These smaller lineages have a high degree of social integration. The members of large lineages, also called by the same name, have more formal relations, consisting primarily of required attendance at each other's ceremonial functions" (p. 117).

Banyankore The Banyankore do not have an age set system or formal initiation process, and are instead organized into groups of family households or clans. Yitzchak (1975) describes in detail the *absence* of age set societies among the Ankole. He writes that "the absence of age-sets in Ankole (an

alternative name for Banyankore) cannot be attributed to the presence there of voluntary associations, admission into and promotion within which is based on personal achievement" (p. 164). Social organization is based on clans, the structure of which he hypothesizes prevented the formation of age sets: "large lineages or clans whose members have rights to territories and whose leaders have political, administrative, or judicial functions. Where such strong particularistic sub-units existed, they made the kingdom less centralized and hindered the formation of age-sets by militating against their universalistic value." Taylor (2017) also describes the kin and clan-based social structure in depth.

Banyole The Banyole social structure is based predominately on extended family and clans. Whyte (1984) provides an extended discussion of the Banyole clan structure, and makes no mention of age sets or age-based social groupings. Lamony (2007, p. 55) notes that the Banyole social organization was "based on clans and clan leaders" and the main parts of social and political life in society consisted of "(a) the immediate family (b) the extended family (c) the elders, and (d) the clan committees."

Banyoro The Banyoro are organized on the basis of kinship, and descriptions of their social organization make no mention of age sets or age-based institutions. Clans are paramount. Taylor (2017) writes, "Clan membership provides a way of categorizing the whole universe of persons likely to be encountered by a man during his lifetime. Everyone was a member of his own clan, or of a clan to all members of which he stood in a particular kinship or affinal relation, or of a clan with a member of which he or one of his agnates had entered into a blood pact, or of a clan to which he was not related in any way" (p. 24). He continues, "Agnation and the unilineal descent principle are of great importance in the Nyoro kinship system and are implicit in all other categories of kin relationships" (p. 25).

Basamia The Samia are organized based on a system of clans and age distinctions are not important. Cattell (1989) notes that age is not an important concept among the Samia and "many people have only a vague sense of their chronological age" (p. 229). The Samia were traditionally organized into villages and the "village world was one of kinship and a very local orientation." Traditionally the Samia were organized with the "diffuse political leadership of numerous clans and shifting subtribe alignments" (p. 233). Lamony (2007) further notes that social organization was "based on clans and clan leaders"' and that the main social organizations were "(a) the immediate family (b) the extended family (c) the elders, and (d) the clan committees."

Basoga The Soga have no age sets and are organized based on clans and a lineage structure. Ochieng (2002) notes that the Soga "had apparently neither circumcision nor age groups" (p. 24). Fallers (2017) describes the clan-based structure of the Soga: "In general, kinship and local group institutions were very similar to those of Buganda [see above], but a few of the more important differences may be noted...Clans were smaller and more numerous than in Buganda; within the area of a few contiguous

villages, Fallers counted more than 150. Several clans may have the same totem, suggesting that fission has not been uncommon. Internally, Soga clans were segmented, but all segments were known by the term nda (literally "inside") together with an eponym" (p. 59).

Batoro Toro social organization is based on clans, which determine the pattern of social interaction as well as status. Taylor (2017) describes the clan system of the Toro in depth: "The principle of clanship is still important as a principle of orientation and interaction. Clan members derive a sense of status from their membership of their particular clan. They feel obliged to be hospitable to, and to aid, one another. In non-royal clans they are careful not to intermarry with any clan member, however distantly related. They feel that it is advisable for property to remain as far as possible within the clan" (p. 51).

Iteso The Iteso have a well-defined age set system. McClusky (2013) contrasts the Iteso with the Baganda: "Another element of sociopolitical organization present among the Iteso, yet absent among the Baganda, was the age-grade system" which led to "clearly demarcated" groups of people based on age (p. 257). Gulliver and Gulliver (2017) write about the prominence of the age set system in Iteso life, noting that the Iteso "divide up the whole of natural existence into categories which are related to the qualities and powers of each age set" (p. 26). Each age set was in charge of a different domain of the natural world and was responsible for it. Tesoland had a "flourishing age set system" that involved the initiation of boys "every one to four years" (p. 25).

Jie The Jie have a well-defined age set system that governs social relationships among members of the group. Foner and Kertzer (1978) list the Jie among a set of societies with prominent age set systems (p. 1088). Initiation takes place at the onset of adulthood and is divided by region. Gulliver and Gulliver (2017) describe the initiation process: "Each man is initiated in his own homestead where elders and spectators collect. The initiate spears a castrated animal in the central cattle kraal. The first brother spears an ox, the second a he-goat, and the third an ox and so on. The speared animal is opened up by the elders and the undigested stomach contents smeared on the initiate with blessings. The initiate now joins publicly in the ceremonial feast of his animal, taking his place with his age-set members at the settlement's ritual grove" (p. 46). They also describe the age set system more broadly: "A generation becomes divided into about three age-classes or sections which are again divided into three or more age-sets. The age-set is the basic group, consisting of men initiated in one to three wet seasons. The name of a new age-set is chosen and given by the most senior men of the tribe at the time" (p. 44). Classification into an age set happens to all boys at birth (p. 46).

Jonam The Jonam do not have age sets and are organized on the basis of segmented lineages. They are described by Southall (2004) as an offshoot of the larger Alur ethnic group, and their social organization closely matches that of the Alur (see above).

Kakwa The Kakwa have a system of age sets. The Minority Rights Group (2020) writes that the Kakwa social organization is very similar to the Iteso (see above) and Karamojong (see below) and is

based on age sets. Shinn and Ofcansky (2013) also note that the "Karo social organization is based on consolidated age groups" (p. 242). The Kakwa are a sub-group of the larger Karo people.

Karamojong The Karamojong have a well-defined system of age sets that govern social and political relationships, more so than any other social form. Dyson-Hudson (1963) writes, "Adult male Karamojong are recruited into named corporate groups of coevals, termed ngasapaneta or ngasapanisia, and are here spoken of as age sets. [...] An age set has members...who are equally uniformly identified by a single shared name, community of status, and a collective role" (p. 358, 376). He concludes that "the general significance of the age system for Karamojong society is, I suggest, that it establishes ranking, coordinates activity by large groups, and provides a sense of political and social continuity, all of which have great utility but none of which is effectively provided by other institutions" (p. 397). Age sets are thus the primary social grouping in Karamojong society.

Kumam The Kumam have a system of age sets. Wetherby (2012) notes that the structure of the Kumam economy was based on age sets. Gulliver and Gulliver (2017) describe the Kumam as a small tribe that is most closely related in terms of economic and social structure to the Teso, who "divide up the whole of natural existence into categories which are related to the qualities and powers of each age set" (p. 26). Each age set was in charge of a different domain of the natural world and was responsible for it. Tesoland had a "flourishing age set system" that involved the initiation of boys "every one to four years" (p. 25).

Lango The Lango have a well-defined age set structure. Eisenstadt (1954) includes the Lango in a list of acephalous tribes whose main social form is age sets. Butt (2017) describes the age set system in detail. Every boy is initiated into the age set system in a major ceremony: "The ewor festival occurs in November at three different localities, in three of the four divisions of Langoland. [...] All the young men, who have reached puberty and have not yet been initiated, gather at the assembling place for their district and with them are the old men whose group year it may be. The old men spend three days teaching the initiates their social duties, the traditions of the Lango tribe and the mysteries of rain-making - together with the rain-dances and songs appertaining to their group. The initiates are secluded from the rest of the people and during this period there is a suspension of all hostilities within Langoland. Any breaker of the peace is killed, and his village is burned. Sexual intercourse is forbidden during this period. On the fourth day the initiates return to the village after certain cleansing rites. The old men perform rituals and the ewor festival is completed. All the initiates take as their group the one which is in charge of the rain-making for that year, irrespective of their father's group" (p. 97). The initiation ceremony and period of isolation is intended to generate a sense of solidarity among members of the same age set.

Lendu The Lendu do not have an age set system and are instead organized into clans, each of which is ruled by a chief. Southall (2004) writes, "There is no trace of any age set organization even to the extent of names for initiation sets" (p. 166). Baxter and Butt (2017) note that there is no ritual marking puberty or circumcision ritual. Instead, boys are circumcised at a young age and "without

ceremony" (p. 127). Baxter and Butt (2017) also describe the clan-based social structure in depth: "Councils of elders of families, villages, sub-clans, and clans operate in their respective spheres as courts of law...There is no centralized political authority, the country being divided up into a number of autonomous chiefdoms...Chiefs are said to be hereditary in clans and sub-clans, although they can sometimes, apparently, name their own successors" (p. 127).

Lugbara The Lugbara do not have age sets and are instead organized around a set of segmentary lineages. Weeks (1973) describes the "absence of distinct culturally defined points of transition from youth to adult (such as circumcision or initiation)" and compares the Lugbara to the Baganda in this respect (p. 297). Thus there is a complete absence of any age-based ritual. Middleton (1960) describes the semgmentary lineage structure of the Lugbara, in which lineage and clan ties are paramount for determining social status and organization. For example: "The traditional pattern of settlement was of clusters of villages, the majority of which were almost always related patrilineally as members of a sub-clan of some eight to twelve generations. The group was internally differentiated into villages, each based upon a patrilineal lineage" (p. 447).

Madi The Madi do not have an age set system. Clans are paramount in their social organization. Baxter and Butt (2017) describe the social organization as based on clans and lineages, with no mention of age sets; for example: "The smallest social and political unit is the household, consisting of a man and his wives and young children, and frequently also some of the married children and younger brothers. [...] About 50 homesteads make up a kaka, or lineage, an exogamous group administered by its senior member and a number of elders (amba eidri), each of whom is responsible for a group of homesteads. The kaka is a corporate body, collectively responsible for the actions of its members. The kaka head has few coercive powers and is the voice, rather than the leader, of his lineage" (p. 117). Individuals primarily identify as members of their clan. Middleton (1955) similarly describes the clan-based structure of identification in details and does not observe any age set structure.

Pokot The Pokot have a well-defined age set structure. Eisenstadt (1954) includes the Pokot in a list of acephalous tribes whose main social form is age sets. Petistany (1951) describes the age set structure of the Pokot in depth throughout his article; the start of adulthood is marked by circumcision with members of ones age group as a form of initiation. Petistany (1951) concludes, "The age sets of the Pokot are as clearly differentiated as those of the other Nandi-speaking tribes of Kenya" (p. 189).

Sabiny The Sabiny have a system of age sets and a major initiation ceremony when individuals become adults and members of their age set. De Wolff (1980) descibes the age set system: "[T]he Sebei [Sabiny], a Kalenjin group on the northern flank of Mount Elgon, had an age-set system similar to that of other Kalenjin. Typically all boys who are circumcised during a certain period form one named age-set. [...] Members of the same age set often change their age group together" (p. 307). Goldschmidt (1967) speaks to the crucial importance of initiation and age set bonds; he writes that "the most important ritual event [is the] periodic initiation of young men and women...culminating in

a highly secret rite in which the neophytes are given instruction in the magical practices of everyday life and are admitted into their age-set" (p. 28). The initiation ritual "also has the function of placing the individual, as a member of a particular age set, in an affiliation that remains throughout life."

So (Tepeth) Foner and Kertzer (1978) list the So in a table of ethnic groups with developed age set systems (p. 1088). They note that the So system is most closely related to the Jie, which is described in detail above.

A.1.3 Groups Included Only to Construct Figure 1

Embu Saberwal (1970) describes the age set system of the Embu in detail. Men are organized into age-based social groups that are initiated together after a circumcision ritual. For example, he notes, "Some weeks or months after his circumcision a warrior learned the name of his age set. For a new and inexperienced member, his age-set was probably important and largely determined his interactional patterns" (p. 30). Solidarity was encouraged within the age set to generate a "corporate mentality" and several practices reinforced the solidarity; for example, Saberwal writes, "Presumably to strengthen age-set solidarity, men were prohibited from dancing with or marrying age-mates' daughters. [...] [I]f a man did in fact marry an age-mate's daughter, the penalty was probably variable, separation being required in some of the cases" (p. 33). The age set structure of the Embu is also described by Middleton and Kershaw (2017), who write that it is similar in nature to that of the Kikuyu, which is described in detail below.

Kalenjin De Wolff (1980) describes the age set structure of the Kalenjin in detail; age sets formed following a circumcision ritual and men proceeded through phases of life with their age group. Age groups were also used to organize men in battle. In particular, De Wolff (1980, p. 307) writes, "Typically all boys who are circumcised during a certain period form one named age-set. [...] Members of the same age set change their age group together." Moreover, the age set system of the Kalenjin even spread to other smaller groups in the region because it was known to be a "good organization for warfare and raiding." Daniels (1982) describes the age set system of the Kalenjin in an extended article describing coordination, solidarity, and exchange between members of Kalenjin age sets.

Kamba The Kamba age system is described by Middleton and Kershaw (2017) as a key social form that determines how men move through the lifecycle and their role at each stage of life. For example, they write, "There are institutionalized age-grades among the Kamba, the more senior of which have political and ritual functions. [...] A male child is known as kaana...kivisi denotes an uncircumcised boy who can herd goats; kamwana, a circumcised boy who is old enough to dance but has not yet reached puberty. After puberty he may become mmanake, a warrior; he may marry and have children, but may not drink beer. Later he becomes nthele, a married man with children who no longer dances, and pays a fee of one to three goats to the anthele on being promoted. There are various types of warrior, differentiated by the role played in warfare."

Kikuyu The Kikuyu have a rigid age set system that begins following a circumcision ritual and period of isolation of adolescent boys. Age sets are described as the key source of social cohesion. Each age set has its own name and sense of group identity, and boys (and girls) initiated into the same age set move through the phases of life together. Middleton and Kershaw (2017) write that "The Kikuyu have two important institutions. [...] They are the age-sets and the generation-sets, both called marika. The component parts of the age-sets, the circumcision years, are also called marika. It is probable that the marika are the most effective forms of tribal cohesion. [...] The age-sets are named, corporate groups, with leaders and fixed membership recruited between defined times and for a specific period and purpose. [...] Each group of boys (and/or girls) circumcised together acquires their own name; during the years following they meet other such named groups in competitive dancing displays; the name of the group which acquires most honour becomes the name of the set as a whole, and after some time the initial names of the smaller groups are forgotten" (p. 35).

Kisii The Kisii do not have age sets and their dominant form of organization are segmented lineage and clan groups, which determine patterns of allegiance as well as residence. Middleton and Tait (2013) describe the Kisii as a "segmentary lineage society," in which kin networks and the lineage structure are the key components of social structure. Age-based social organizations are not mentioned. Similarly, Levine (2013) describes the clan structure as the main form of social organization and does not mention age sets; he writes, "Each clan was divided and subdivided into segmentary lineages which were, for the most part, highly localized and governed by informal councils of elders" (p. 63). Clans and lineages were localized and formed the "framework of community organization."

Luhya The Luhya have a structured age set system. Simiyu (1991) describes this system in detail, which involves "mass circumcision" rituals during initiation periods (p. 134); Simiyu (1991) also lists the names of each age set at the time of study (p. 135), reinforcing the fact that the age system was well defined. Mayende (2022) studies the origins of the Babukusu age set system (a sub-group of the Luhya); he writes that the circumcision ritual, which initiates age set members, has been "practiced for ages" and "contains a myriad of rituals constituting coded significant values and norms both to the initiates and the community" (p. 206). Each circumcision group is given a separate name and unique identity based on the events that occurred during the year of the initiation ceremony (p. 208)

Luo The Luo do not have age sets and are instead organized around clans. Butt (1952) writes about the Luo that "[t]here are no indigenous age classes" (p. 169). Instead, she describes that the main social structure is based on clans formed from segmented lineages: "Each Luo tribe has a dominant clan or lineage. The clan has a lineage structure and lineages are differentiated by adding to the name of the clan or larger lineage name and the individual name of the smaller branch. [...] The relationship between kinship and territorial units seems to follow closely the pattern found in other Nilote tribal groups" (p. 110).

Maasai Maasai social organization is based on an age set system. Some discussion of Maasai age sets is provided in the main text in Section D. Huntingford (2017) also describes the Maasai age structure, which he argues was initially designed for armed conflict, in depth: "The main function of the age-sets was to provide a permanent source of man-power for fighting. [...] An attitude of respect is required of junior to senior age-sets, while between members of the same set there is a relationship of equality and a sense of solidarity in their relations with other sets. Membership of a set also involves restrictions on both pre-marital and marital relations, of which mention has already been made (p. 119). There is an initiation period in which individuals entering the same age set are excluded from the group for an extended period of time. During the initiation period, members of Maasai age sets "cultivate and parade an ethos of sharing," which is characterized by "an excessive display of 'group indulgence,' opposed to any suggestion of self interest" (Spencer, 2014, p. 45).

Meru Middleton and Kershaw (2017) describe the Meru as having a similar organization structure, including age system, to the Kikuyu, who are described in detail above. Holding (1942) discusses the Meru age set system in depth, including solidarity among age sets and the existence of initiation rituals. He writes, "The most significant feature of the Meru tribal organization is the intricate system of age grades which cuts across family and clan loyalties, and which originally provided both the group of warriors who were responsible for the defense of the country and the group of elders who had administrative power. [...] Men who were circumcised within a certain period of time are considered to belong to the same generation," each of which has its own name and specific identity (p. 59)

Taita/Taveta The Taita/Taveta have a well-documented age set structure for both men and women, involving an initiation ceremony and a period of isolation to facilitate bonding among members of each age set (Prins, 2017). Prins (2017) writes, "The system of age sets is known by the Bantu word irika [which refers to] any one of the successive age sets or groups of boys initiated together. [...] Boys who enter the bachelors' hut (garo) at the same time constitute one body, called wagaro. Entry into the garo follows an initiation ceremony (mwari) which takes place at the onset of adolescence and lasts about a week" (p. 124).

Pokomo The Pokomo have a conserved system of age sets, involving an initiation ceremony and a period of isolation to encourage bonding among the age set members. Members of Pokomo age sets even live together for extended periods of time between initiation and the age of marriage. Prins (2017) writes, "The tribal organization is similar to that of the Nyika...the system of age sets being known by the Gaua name luva...Boys who enter the young men's house (gane; nyumba ya worani) at the same time constitute a luva. From their entrance into the gane until they leave it on marriage, i.e. between the ages of c.14 or 15 and c.25-30 they are known as worani" (p. 24).

Iteso The Iteso have an age set system McClusky (2013) contrasts the Iteso with the Baganda: "Another element of sociopolitical organization present among the Iteso, yet absent among the Baganda, was the age-grade system" which led to "clearly demarcated" groups of people based on age (p. 257).

Gulliverand Gulliver (2017) write about the prominence of the age set system in Iteso life, noting that the Teso "divide up the whole of natural existence into categories which are related to the qualities and powers of each age set" (p. 26). Each age set was in charge of a different domain of the natural world and was responsible for it. Tesoland had a "flourishing age set system" that involved the initiation of boys "every one to four years" (p. 25).

Additional Groups The Somali, Turkana, Samburu, Borana, Gabra, and Rendille are also included in the Kenya's DHS survey. The source material corresponding to those groups is in Table A1 and the groups are described in Section A.1.1.

Table A1: Identifying Age Set Societies: Kenya's Hunger Safety Net Program

Ethnic Group	Share of HSNP Sample	Agesets	References
Borana	12.26	Yes	Legesse, Asmarom. *Gada: Three approaches to the study of African society.* New York: Free Press, 1973.; Tagawa, Gen. "The Logic of a generation-set system and age-set system: Reconsidering the structural problem of the Gadaa System of the Borana-Oromo." Nilo-Ethiopian Studies 2017.22 (2017): 15-25.
Burji	1.78	No	Amborn, Hermann, and Ruth Schubert. "The contemporary significance of what has been. Three approaches to remembering the past: Lineage, gada, and oral tradition." History in Africa 33 (2006): 53-84.; Debelo. (2012). Emerging Ethnic Identities and Inter-Ethnic Conflict: The Guji-Burji Conflict in South Ethiopia. Studies in Ethnicity and Nationalism, 12(3), 517?533.
Gabra	5.49	Yes	Tablino, Paolo. *The Gabra: camel nomads of northern Kenya.* No. 4. Paulines Publications Africa, 1999.; Shun, S. A. T. O. "The Rendille subsistence groups based on age-system." African study monographs, supplementary issue 3 (1984): 45-57.
Garre	7.31	No	Beaman, Anne W. The Rendille age set system in ethnographic context: adaptation and integration in a nomadic society. Diss. 1981; Lewis, Ioan M. "Force and fission in northern Somali lineage structure." American Anthropologist (1961): 94-112.; Lewis, Ioan Myrddin. A Pastoral Democracy: a study of pastoralism and politics among the northern Somali of the Horn of Africa. James Currey Publishers, 1999.
Rendille	8.56	Yes	Spencer, Paul. Nomads in alliance: symbiosis and growth among the Rendille and Samburu of Kenya. Oxford University Press, 2012.; Stewart, Frank Henderson. "Fundamentals of Age-Group Systems." (1977).; Beaman, Anne W. The Rendille age set system in ethnographic context: adaptation and integration in a nomadic society. Diss. 1981.; Handley, Carla S., "Notes and Interview Transcripts from Northern Kenya," 2009. Field Notes.; Shun, S. A. T. O. "The Rendille subsistence groups based on age-system." African study monographs, supplementary issue 3 (1984): 45-57.
Samburu	2.87	Yes	Spencer, Paul. Nomads in alliance: symbiosis and growth among the Rendille and Samburu of Kenya. Oxford University Press, 2012.; Handley, Carla S., "Notes and Interview Transcripts from Northern Kenya," 2009. Field Notes.

Table A1 Continued: Identifying Age Set Societies: Kenya's Hunger Safety Net Program

Ethnic Group	Share of Sample	Agesets	References
Somali	35	No	Beaman, Anne W. The Rendille age set system in ethnographic context: adaptation and integration in a nomadic society. Diss. 1981.; Lewis, Ioan M. "Force and fission in northern Somali lineage structure." American Anthropologist (1961): 94-112.; Lewis, Ioan Myrddin. A Pastoral Democracy: a study of pastoralism and politics among the northern Somali of the Horn of Africa. James Currey Publishers, 1999.
Turkana	26.54	Yes	Gulliver, Philip H. "The Turkana age organization." American Anthropologist 60.5 (1958): 900-922.; Handley, Carla S., "Notes and Interview Transcripts from Northern Kenya," 2009. Field Notes.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.

Table A2: Identifying Age Set Societies: Uganda's DHS

Ethnic Group	Share of Sample	Agesets	References
Acholi	5.84	Yes	Butt, Audrey. The Nilotes of the Sudan and Uganda: East Central Africa Part IV. Routledge, 2017.; Whitmire, Leslie. The creation and evolution of the Acholi ethnic identity. Clemson University, 2013.
Alur	2.95	No	Southall, Aidan William. Alur Society: A Study in Processes and Types of Domination. LIT Verlag Münster, 2004.; Butt, Audrey. The Nilotes of the Sudan and Uganda: East Central Africa Part IV. Routledge, 2017.
Baganda	13.16	No	McCluskey, Kathleen A. Life-Span Developmental Psychology: Historical and Generational Effects. Elsevier, 2013.; Fallers, Margaret Chave. The Eastern Lacustrine Bantu (Ganda, Soga): East Central Africa Part XI. Routledge, 2017.; Ochieng, William Robert. Historical Studies and Social Change in Western Kenya: Essays in Memory of Professor Gideon S. Were. East African Publishers, 2002.
Bagisu	5.36	No	De Wolf, J. J. "The Diffusion of Age-Group Organization in East Africa: A Reconsideration." Africa: Journal of the International African Institute 50, no. 3 (1980): 305–10. https://doi.org/10.2307/1159121.; La Fontaine, Jean Sybil. The Gisu of Uganda: East Central Africa Part X. Routledge, 2017.
Bakiga	7.67	No	Taylor, Brian K. The Western Lacustrine Bantu (Nyoro, Toro, Nyankore, Kiga, Haya and Zinza with Sections on the Amba and Konjo): East Central Africa Part XIII. Routledge, 2017.
Banyankore	9.12	No	Elam, Yitzchak. "Family and Polity in Ankole: The Hima Household and the Absence of Age Sets." Ethnology 14, no. 2 (1975): 163–71. https://doi.org/10.2307/3773087.; Taylor, Brian K. The Western Lacustrine Bantu (Nyoro, Toro, Nyankore, Kiga, Haya and Zinza with Sections on the Amba and Konjo): East Central Africa Part XIII. Routledge, 2017.
Banyole	1.69	No	Lamony, Stephen Arthur. "Approaching National Reconciliation in Uganda: Perspectives on Applicable Justice Systems." Ugandan Coalition of the International Criminal Court, 2007; Banyole also described as similar in structure to the Basamia, who do not have age sets (see Samia); Whyte, Michael A., and Susan Reynolds Whyte. "Peasants and Workers: The Legacy of Partition Among the Luyia-Speaking Nyole and Marachi." Journal of the Historical Society of Nigeria 12.3/4 (1984): 139-158.
Banyoro	3.29	No	Taylor, Brian K. The Western Lacustrine Bantu (Nyoro, Toro, Nyankore, Kiga, Haya and Zinza with Sections on the Amba and Konjo): East Central Africa Part XIII. Routledge, 2017.

Table A2 Continued: Identifying Age Set Societies: Uganda's DHS

Ethnic Group	Share of Sample	Agesets	References
Basamia	1.5	No	Sokolovsky, Jay. The Cultural Context of Aging: Worldwide Perspectives. Praeger, 2009.; Lamony, Stephen Arthur. "Approaching National Reconciliation in Uganda: Perspectives on Applicable Justice Systems." Ugandan Coalition of the International Criminal Court, 2007; Cattell, Maria G. "Knowledge and social change in Samia, Western Kenya." Journal of Cross-Cultural Gerontology 4.3 (1989): 225-244.
Basoga	6.27	No	Ochienga, William Robert. Historical Studies and Social Change in Western Kenya: Essays in Memory of Professor Gideon S. Were. East African Publishers, 2002.; Fallers, Margaret Chave. The Eastern Lacustrine Bantu (Ganda, Soga): East Central Africa Part XI. Routledge, 2017.
Batoro	2.7	No	Taylor, Brian K. The Western Lacustrine Bantu (Nyoro, Toro, Nyankore, Kiga, Haya and Zinza with Sections on the Amba and Konjo): East Central Africa Part XIII. Routledge, 2017.
Iteso	8.85	Yes	McCluskey, Kathleen A. Life-Span Developmental Psychology: Historical and Generational Effects. Elsevier, 2013.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.
Jie	0.66	Yes	Foner, Anne, and David Kertzer. "Transitions Over the Life Course: Lessons from Age Set Societies." American Journal of Sociology 83, no. 5 (1978): 1081-1104.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.
Jonam	0.26	No	Southall, Aidan William. Alur Society: A Study in Processes and Types of Domination. LIT Verlag Münster, 2004; Also, sub-division of Alur, which do not have age sets (see Alur)
Kakwa	0.37	Yes	Minority Rights Group. "Uganda." Accessed November 10, 2020. https://minorityrights.org/country/uganda/.; Shinn, David H., and Thomas P. Ofcansky. Historical dictionary of Ethiopia. Scarecrow Press, 2013.
Karimojong	1.53	Yes	Dyson-Hudson, Neville. "The Karimojong Age System." Ethnology 2, no. 3 (1963): 353–401. https://doi.org/10.2307/3772867.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.
Kumam	0.87	Yes	Weatherby, John M. The Sor Or Tepes of Karamoja (Uganda): Aspects of Their History and Culture. Ediciones Universidad de Salamanca, 2012; Also described as closely related socials structure to Karimojong, who have age sets.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.

Table A2 Continued: Identifying Age Set Societies: Uganda's DHS

Ethnic Group	Share of Sample	Agesets	References
Lango	7.01	Yes	Adt, S. N. Eisenst. "African Age Groups: A Comparative Study." Africa: Journal of the International African Institute 24, no. 2 (1954): 100–113. https://doi.org/10.2307/1156134.; Butt, Audrey. The Nilotes of the Sudan and Uganda: East Central Africa Part IV. Routledge, 2017.
Lendu	0.04	No	Southall, Aidan William. Alur Society: A Study in Processes and Types of Domination. LIT Verlag Münster, 2004.; Baxter, Paul Trevor William, and Audrey Butt. The Azande and Related Peoples of the Anglo-Egyptian Sudan and Belgian Congo: East Central Africa Part IX. Routledge, 2017.
Lugbara	2.91	No	Weeks, Sheldon G. "Youth and the Transition to Adult Status: Uganda." Journal of Youth and Adolescence 2, no. 3 (September 1, 1973): 259–70. https://doi.org/10.1007/BF02213861.; Middleton, John. "Social Change among the Lugbara of Uganda." Civilisations (1960): 446-456.
Madi	1.08	No	Mtodleton, John. "Notes on the Political Organization of the Madi of Uganda." African Studies 14, no. 1 (1955): 29–36.; Baxter, Paul Trevor William, and Audrey Butt. The Azande and Related Peoples of the Anglo-Egyptian Sudan and Belgian Congo: East Central Africa Part IX. Routledge, 2017.
Pokot	0.36	Yes	Adt, S. N. Eisenst. "African Age Groups: A Comparative Study." Africa: Journal of the International African Institute 24, no. 2 (1954): 100–113. https://doi.org/10.2307/1156134.; Peristiany, Jean George. "The age-set system of the pastoral Pokot: the Sapana initiation ceremony." Africa 21.3 (1951): 188-206.
Sabiny	0.61	Yes	Goldschmidt, Walter. Sebei Law. University of California Press, 1967.; De Wolf, J. J. ?The Diffusion of Age-Group Organization in East Africa: A Reconsideration.? Africa: Journal of the International African Institute 50, no. 3 (1980): 305?10. https://doi.org/10.2307/1159121.
So (tepeth)	0.03	Yes	Foner, Anne, and David Kertzer. "Transitions Over the Life Course: Lessons from Age Set Societies." American Journal of Sociology 83, no. 5 (1978): 1081–1104.

Table A3: Identifying Age Set Societies: Kenya's DHS (Groups Not Covered in Table A1, Only Used for Map)

Ethnic Group	Agesets	References
Embu	Yes	Saberwal, Satish. "The traditional political system of the Embu of central Kenya." (1970).; Middleton, John, and Greet Kershaw. The Kikuyu and Kamba of Kenya: East Central Africa Part V. Routledge, 2017.
Kalenjin	Yes	De Wolf, J. J. "The Diffusion of Age-Group Organization in East Africa: A Reconsideration." Africa: Journal of the International African Institute 50, no. 3 (1980): 305-10.; Daniels, Robert E. "The extent of age-set coordination among the Kalenjin." 25eme conference annuelle de l'African Studies Association, 1982.
Kamba	Yes	Middleton, John, and Greet Kershaw. The Kikuyu and Kamba of Kenya: East Central Africa Part V. Routledge, 2017.
Kikuyu	Yes	Middleton, John, and Greet Kershaw. The Kikuyu and Kamba of Kenya: East Central Africa Part V. Routledge, 2017.
Kisii	No	Middleton, John, and David Tait. Tribes without rulers: Studies in African segmentary systems. Routledge, 2013.; LeVine, Robert A. "The Gusii Family." The Family Estate in Africa: Studies in the Role of Property in Family Structure and Lineage Continuity 6 (2013): 63.
Luhya	Yes	Simiyu, Vincent G. "The Emergence of A Sub-Nation: A History of Babukusu to 1990." Transafrican Journal of History (1991): 125-144.; Mayende, Godfrey Banda. "Age-Set Systems Among the Babukusu of Western Kenya." EPRA International Journal of Multidisciplinary Research (IJMR): 206.
Luo	No	Butt, Audrey. "The Nilotes of the Anglo-Egyptian Sudan and Uganda." (1952).
Maasai	Yes	Huntingford, George Wynn Brereton. The Southern Nilo-Hamites: East Central Africa Part VIII. Routledge, 2017.
Meru	Yes	Middleton, John, and Greet Kershaw. The Kikuyu and Kamba of Kenya: East Central Africa Part V. Routledge, 2017.; Holding, E. Mary. "Some Preliminary Notes on Meru Age Grades." Man 42 (1942): 58-65.
Taita/Taveta	Yes	Prins, Adriaan Hendrik Johan. The Coastal Tribes of the North-Eastern Bantu (Pokomo, Nyika, Teita): East Central Africa Part III. Routledge, 2017.
Pokomo	Yes	Prins, Adriaan Hendrik Johan. The Coastal Tribes of the North-Eastern Bantu (Pokomo, Nyika, Teita): East Central Africa Part III. Routledge, 2017.
Iteso	Yes	McCluskey, Kathleen A. Life-Span Developmental Psychology: Historical and Generational Effects. Elsevier, 2013.; Gulliver, Pamela, and Philip Hugh Gulliver. The Central Nilo-Hamites: East Central Africa Part VII. Routledge, 2017.

A.2. Other Ethnicity-Level Characteristics

This section describes data on the ethnicity-level characteristics introduced in Section C and used as controls in our sensitivity analyses in Sections B.1 and B.3. Most of the variables are constructed from Murdock (1967)'s *Ethnographic Atlas*, a standard source of ethnicity-level ethnographic information. We matched the full set of ethnic groups in our samples from both Kenya and Uganda (Tables A1 and A2) to the *Ethnographic Atlas* by hand.

- **Election of Local Headman.** Coded from variable v72 in Murdock (1967)'s Ethnographic Atlas. We construct an indicator variable that equals 1 if v72=6 (that is, if succession to the office of local headman is determined by "election or other formal consensus, nonhereditary"). We also construct an indicator variable that equals 1 if v72=1 or v72=2 (that is, if the local headman is the "patrilineal heir" or "matrilineal heir")

- **Bride Price.** Coded from variable v6 in Murdock (1967)'s Ethnographic Atlas as indicator variables that equals one when v6 = 1 ('bride price or bride wealth').

- **Polygyny.** Coded from variable v9 in Murdock (1967)'s Ethnographic Atlas as an indicator variable that equals one if v9>2

- **Single Inheritor of Land.** Coded from variable v75 in Murdock (1967)'s Ethnographic Atlas as an indicator variable that equals 1 if v75 is equal to 2, 3, or 4 (exclusive, ultimogeniture, or primogeniture).

- **Women Do Not Inherit Land.** Coded from variable v74 in Murdock (1967)'s Ethnographic Atlas as an indicator variable that equals 1 if v74 is not equal to 4 or 5.

- **Patrilineality and Matrilineality.** Coded from variable v43 in Murdock (1967)'s Ethnographic Atlas as indicator variables that equals 1 when v43 = 1 ('patrilineal') or 3 ('matrilineal'), respectively.

- **Patrilocality and Matrilocality.** Coded from variable v12 in Murdock's Ethnographic Atlas as indicator variables that equals one when v12 = 8 ('patrilocal') or 5 ('matrilocal') respectively.

- **Cousin Marriage.** Coded from variable v24 in Murdock (1967)'s Ethnographic Atlas as indicator variables that equals one when v24 is not equal to 8 ('no first or second cousin marriages').

- **Plow Used.** Coded from variable v39 in Murdock (1967)'s Ethnographic Atlas as indicator variables that equals one when v39 is not equal to one.

- **Female Participation in Agriculture.** Coded from variable v54 in Murdock (1967)'s Ethnographic Atlas. We construct from v54 an indicator variable that equals one if women participate less than men in agricultural production.

- **Levels of Jurisdictional Hierarchy of the Local Community.** Variable v32 from Murdock (1967)'s Ethnographic Atlas. This variable takes integer values from 1–3.

- **Levels of Jurisdictional Hierarchy Beyond the Local Community.** Variable v33 from Murdock (1967)'s Ethnographic Atlas. This variable takes integer values from 1–5.

- **Settlement Complexity.** Variable v30 from Murdock (1967)'s Ethnographic Atlas. This variable takes integer values from 1–8 increasing in pre-colonial settlement complexity. The categories range from 'nomadic or fully migratory' (1) to 'complex settlements' (8).

- **Pre-colonial conflict.** We use historical conflict data from Besley and Reynal-Querol (2014) to construct an indicator that equals one for ethnic groups that experienced conflict between 1400 and 1700AD. Conflicts were linked to ethnic groups using the location of each conflict as mapped by Murdock (1959).

- **Pastoralism.** Constructed as in Becker (2019) as an interaction between the ethnic group's dependence on agriculture and an indicator that equals one if the group's predominant animal is a herding animal. Dependence on agriculture (measured as a share of total subsistence, between 0 and 1) is computed from v4 in Murdock's Ethnographic Atlas using the midpoint of each bin. The herding animal indicator is also constructed from Murdock's Ethnographic Atlas as an indicator that equals one if v40>2. The final variable ranges from 0–1.

- **Conflict.** Our primary source of conflict data is the *Armed Conflict Location and Event Data Project* (ACLED): `https://www.acleddata.com`. The data are coded from a variety of sources, including "reports from developing countries and local media, humanitarian agencies, and research publications" (`http://www.acleddata.com/about-acled/`). The database includes information on the location (latitude and longitude), date, and other characteristics of all known conflict events in Africa since 1997. We link each conflict to an ethnic group using the latitude and longitude of each conflict along with the ethnic group map from Murdock (1959). As an additional source of data, we also measure conflict using the *Uppsala Conflict Data Program* (UCDP): `http://ucdp.uu.se/#/exploratory`. The UCDP data also record the location of each conflict, which we link to ethnic groups in the sample using the same strategy.

A.3. Ethnicity-Level Correlates of Age Set Organization

Here, we examine the extent to which hypotheses about the origins and correlates of age set organization are born out in our sample of ethnicities from Uganda and Kenya, using the data set of ethnicity level characteristics described in Section A.2. In particular, we investigate whether age set organization is correlated with characteristics designed to capture the several existing hypotheses about the origin and functions of age set organization, including: (A) conflict and herding, (B) political succession, (C) marriage and the role of women (see Section C). Additionally, we explore whether the existence of the age set practice correlates with pre-colonial economic and political development.

We report the estimates in Table A4 for the set of 29 ethnic groups of our sample that we were able to match to the Murdock (1967) *Ethnographic Atlas*. We do not find evidence of systematic differences between societies with and without age set in our sample of ethnic groups from Uganda and Kenya. Panel (A) reports the relationship between age set organization and conflict, including conflict

measured in the present day from two separate sources (the Armed Conflict Location & Event Data Project and the Uppsala Conflict Data Program) and pre-colonial conflict. We also find no evidence of a relationship with dependence on pastoralism.

Similarly, we find no relationship between in our sample between age set organization and political succession, measured as indicators for whether the local leader is elected or whether the local leader is a hereditary position (Panel B). We also find no relationship between age set organization and a range of potential measures of and proxies for features of marriage and the role of women in society (Panel C), including the presence of polygamy, bride price, female inheritance, cousin marriage, plow use, patrilocality, and female participation in agriculture. A range of potential covariates were *not* included in the table because there is no variation in our sample, further evidence that our sample consists of a comparable set of ethnic groups. Potentially relevant characteristics with no in-sample variation include: matrolocality, sex differences in animal husbandry, sex differences in the inheritance rule for moveable property, matrilineality and patrilineality.

The one significant relationship that we find is between age set organization and political centralization, measured as the number of levels of jurisdictional hierarchy beyond the local community (Panel D). We find that age set societies are significantly less centralized; on average, there are 0.8 fewer levels of jurisdictional hierarchy on a scale of 1-5. This finding is possibly consistent with work on the role of cross-cutting ties in limiting political centralization, since the age sets serve as a check on the accumulation of political power (e.g. Bohannan, 1964). It is unclear *ex ante* why this relationship would bias our main estimates, and moreover this significant difference could be due to random chance; nevertheless, we are careful to control for the role of pre-colonial state centralization in our main analysis. All of our findings are robust to accounting for ethnicity-level variation in pre-colonial development.

The lack of major observable differences between societies with and without age sets is also consistent with a more recent view in anthropology that social structure diffuses in idiosyncratic ways and without an obvious set of causal determinants (e.g. Beckingham and Huntingford, 1954; Kelly, 1983; Hinew, 2012).[36] It is also consistent with recent hypotheses about "cultural mismatch," or the idea that particular cultural organizations formed historically to serve specific functions or in response to specific historical conditions, and then persist despite the fact that they no longer serve the same purpose and initial conditions have changed (Nunn, 2021)

A.4. Hunger Safety Net Program (HSNP) Evaluation

We use the full set of data from the baseline and first follow-up surveys from the randomized impact evaluation of Kenya's HSNP. The data are publicly available. A detailed description of the baseline survey, along with all data available for download, can be accessed here: https://datacatalog.worldbank.org/dataset/kenya-hunger-safety-net-programme-impact-evaluation-2009-2010. The same for the first follow up survey can be accessed here: https://datacatalog.worldbank.org/dataset/kenya-hunger-safety-net-programme-impact-evaluation-2010-2011.

[36] This evolutionary model is also consistent with recent evidence presented in Moscona et al. (2020).

In order to evaluate the HSNP, the government of Kenya, together with Oxford Policy Management, selected 48 sub-locations to conduct a randomized evaluation (a sub-location is a superset of villages). Each sub-location was assigned to either the treatment or control group. In the treatment group, transfer-eligible households were immediately given 2,500 KSh ($\sim$ 25 USD) every two months, corresponding to roughly 25% of average household income in the region. In control sub-locations, transfer eligibility was also determined but the actual transfers were withheld for two years.

Transfer eligibility in both the treatment and control groups was determined via one of three targeting mechanisms. The targeting mechanisms were community based targeting, in which the community selected households to get the transfers; dependency ratio targeting, in which households were selected based on characteristics of household health and nutrition; and a social pension program, in which households were selected on the basis of the number of household members over the age of 55. In our analysis of cohort spillover effects, we abstract from the targeting mechanisms and flexibly control for ethnicity-by-targeting mechanism fixed effects in our baseline specification. In our analysis of inter-generational transfers, we exploit the pension program targeting mechanism directly since it affected exclusively older individuals.

The HSNP baseline survey contains all the information necessary in order to construct the age cohort treatment variable, including the ethnicity (language group) of each household, the age of each household member, the treatment status of the sub-location, and the eligibility status of the household. In the analysis of within-cohort spillovers, we use total consumption and food consumption, both reported at the household level, as the dependent variables. In the analysis of inter-generational transfers, we use spending on education—reported at the household level—and measures of child-level nutrition—reported for all children under age five—as the dependent variables.

A.5. Uganda's Demographic and Health Surveys (DHS)

Our main source of data for the analysis of Uganda's pension program is the Demographic and Health Surveys (DHS). For our primary analysis, we use the 2016 round. We also use the 2006 round of the survey, which was collected prior to the introduction of the pension program, for our placebo analysis. The DHS surveys are publicly available. The data and all corresponding materials for the 2016 round can be found here: https://dhsprogram.com/methodology/survey/survey-display-504.cfm. The data and all corresponding materials for the 2016 round can be found here: https://microdata.worldbank.org/index.php/catalog/1514.

A.6. The Population of Age Set Societies

In this section, we describe our estimate of the number of people who are members of ethnic groups in which age sets are traditionally the dominant form of social organization. As discussed above, information on the presence or prominence of age sets is not available from existing ethnographic databases of Africa, including the Murdock (1967)'s *Ethnographic Atlas*. Therefore, in order to identify age set societies in sub-Saharan Africa as comprehensively as possible, we turn to the *Ethnographic Survey of Africa*, which is a series of qualitative studies edited by Daryll Forde and published between the 1940s and the 1970s by the International African Institute in London.

The *Survey* is comprised of fifty individual volumes, divided by region (Central Africa, East Central Africa, North Eastern Africa, Southern Africa, West Africa, and West Central Africa) and by ethnic group. Each entry contains detailed information about the social and political organization, religious beliefs, economic activity of the ethnic group, as well as the geography and ecology of the area they inhabit. The surveys were collected during the middle of the 20th century and therefore reflect how social and political organization functioned at the time. Therefore, we view the data collected from these volumes as measures of the *historical* characteristics of ethnic groups. The extent to which age set organization has persisted to the present is an empirical question, and we discuss this question at length in Section II.

In order to estimate the population of people who were traditionally members of age set organizations we followed a four steps process.

First, we went through all *Survey* volumes and developed a hierarchical list of ethnic groups. That is, we listed all ethnic groups, ethnic sub-groups (i.e. subdivisions of ethnic groups), ethnic sub-sub-groups, etc., that are covered by the *Survey*. We refer to the broadest category as the "Level 1" group and we refer to increasingly detailed sub-divisions as Level 2, Level 3, etc. This hierarchical structure is important to make sure that we do not double-count the population of ethnic groups that are, for example, sub-groups or super-groups of other groups discussed in the *Survey*.

Second, we determined whether or not age set organization was the dominant form of social organization for all ethnic groups in the list. We began with the most detailed ethnic sub-divisions from each book and then moved to larger sub-divisions if the information was too sparse at the most detailed level. In order to include a group in the list of age set societies, we required positive evidence that are sets were prevalent and that individuals feel a strong sense of obligation and allegiance to the age set, or that age sets (as opposed to the extended family) shaped local social structure and political organization. At the most detailed level of our hierarchical list of ethnic groups, this yielded 429 ethnic groups in which age sets were the dominant form of social organization, out of 1736 ethnic groups in our sample.

Third, we constructed the population estimate for the ethnic group in our sample using two different methodologies. For each ethnic group, we first scraped the population information contained in *The Joshua Project*, which reports ethnicity-level population for a broad set of African ethnicities. We then went through all un-matched groups and attempted to link each to modern census population estimates by hand. In total, we were able to find the population for at least one level of the group hierarchy for 62% of the groups in the sample. The full list of ethnic groups, along with the source of population data for each group, is available upon request.

Fourth, we estimated the total population of all age set societies using an iterative process. We began with the Level 4 groups. If we had linked the Level 4 group to a population estimate, we defined that as the population of that Level 4 group; if not, we imputed the group population as the sum of the population of all Level 5 groups within the Level 4 group, knowing that this is likely to be an under-estimate. Next we turned to the Level 3 groups and (analogously) defined the population as the matched population if we had linked the group to a population estimate and, if not, imputed it as the sum of the population of all Level 4 groups within the Level 3 group for which we have

population data. We repeated the same process for Levels 1 and 2. This process makes it possible to build as accurate a population estimate as possible, given the missing data at each level, while making sure that we do not double count groups that are sub-sets or super-sets of each other.

At the end of this process, we estimate that 209,568,576 individuals are members of societies in which age sets were the traditionally dominant form of social organization. While this estimate is likely imperfect, it underscores that age sets are a common feature of social organization in sub-Saharan Africa and are a dominant force in the lives and histories of a large population. Moreover, it is likely to be (if anything) an under-estimate, since the *Survey* has sparse coverage in some parts of the continent and since there were several age set societies that we were unable to match with reliable population estimates.

B. Detailed Description of Supplementary Results

B.1. Kenya's HSNP: Additional Controls

We document that the baseline finding of substantially larger within-cohort spillovers in age set societies is robust to controlling for a range of additional ethnicity-level characteristics. These results suggest that the distinction we find between age-based and kin-based organization is not driven by some other ethnicity-level characteristic. In particular, for ethnicity-level characteristic Z_e, we control directly for $\text{ShareAge}_{aev} \cdot \mathbb{I}^{\text{Treat}}_{v(c)} \cdot Z_e$, as well as all of its components and double-interactions. If the effects on within-cohort spillovers were instead driven by variation in ethnicity-level characteristic Z_e, the finding would not be robust to the inclusion of these controls. Figure A4 reproduces our main estimates of $\gamma_1 - \gamma_2$ after accounting for several ethnicity level controls. First, we control in this way for language sub-family fixed effects (leftmost bar); this restricts our analysis of age-based and kin-based group to comparisons within a given language family, and also fully absorbs any differences across broader ethnic distinctions. Second, we control for fixed effects in state centralization (measured as levels of jurisdictional hierarchy beyond the local community) and development (measured as historical settlement pattern complexity) (middle column).[37] Finally, we include all ethnicity-level controls along with the full set of baseline household-level controls (rightmost column).

There is a range of ethnicity-level covariates that we do *not* control for because there is no variation within our sample after accounting for the baseline set of fixed effects. These include matrilocality, patrilocality, matrilineality, patrilineality, bride price customs, cousin marriage customs, and inheritance customs. Despite their potential importance for economic analysis (La Ferrara, 2007; La Ferrara and Milazzo, 2017; Lowes, 2018b,a; Schulz et al., 2019; Schulz, 2020; Bau, 2021), these features of society are constant in our sample.

Our measurement of each ethnicity-level characteristic is described in Appendix Section A.2.

[37] In order to have as large a sample as possible, we also include a fixed effect for each variable that indicates when the value is missing in the *Ethnographic Atlas*.

B.2. Uganda's Senior Citizen Grant: Alternative Pension Exposure Measures

One possible shortcoming of our baseline measure is that it uses the 2016 household age distribution to retroactively estimate pension receipt during preceding years. To document that this feature of variable construction does not drive the results, we estimate a second exposure measure that only relies on the age distribution in 2016. We define:

$$\text{Potential Exposure}_h^{2016} = \sum_{i \in h} \mathbb{I}_{ih,2016}^{\text{Age65+}} \tag{6}$$

Our baseline estimates using this variable, reported in Table A14, capture only the impact of pension exposure in 2016, which we can measure directly. The results are very similar.

Another potential shortcoming of the baseline pension program exposure measure—which is likely to bias our main estimates downward—is that, for simplicity, our baseline exposure measure does not exploit variation in child age. We estimate a separate exposure measure that does take variation in child age into account; in particular, we define:

$$\text{Potential Exposure}_h^{\text{ChildAge}} = \sum_{t=2011}^{2016} \left[\left(\sum_{i \in h} \mathbb{I}_{iht}^{\text{Age65+}} \right) \left(\sum_{i \in h; i \text{ under } 5} \mathbb{I}_{iht}^{\text{Born After } t} \right) \right] \tag{7}$$

Our baseline estimates using this alternative pension exposure measure are also reported in Table A14 and again, the results are very similar.

B.3. Uganda's Senior Citizen Grant: Additional Controls

Here, we explore the robustness of our findings to the inclusion of a broad range of controls. These results are presented in Table A15. In column 1 we include fixed effects for the number of children under five in each household and the results remain the same. It is possible that differences in wealth between societies with and without age sets might affect the extent to which they invest financial windfalls in children. In column 2, we therefore control directly for a wide set of measures of household asset holding. These controls include indicators for the presence of electricity, radio, television, a refrigerator, a bicycle, a motorcycle, and a car or truck, as well as fixed effects for main floor material, main roof material, main wall material, the type of toilet facility, and the number of rooms used for sleeping. As an alternative strategy, in column 3 we control for fixed effects of the 5-point wealth index computed by the DHS. In both cases, the results are again very similar.

While in Table A4 we found little evidence of systematic differences between societies with and without age sets across a range of observable characteristics, we next show that the results are robust to controlling for other important features of social and political organization. To account for an ethnicity-level characteristic $Z_{e(h)}$, we include controls of the form $\text{PotExp}_h \cdot \mathbb{I}_{d(h)}^{\text{Pilot}} \cdot Z_{e(h)}$; we also include all relevant double interactions and direct effects. In column 4 we control flexibly in this way for fixed effects in the number of levels of jurisdictional hierarchy beyond the local community and settlement pattern complexity, both measured from the *Ethnographic Atlas*; these are frequently used

measures of historical political and economic development, respectively.[38] In column 5, we add controls for language group fixed effects, thus flexibly absorbing differences in each household's coarser language category. The estimates remain very similar.

An additional possibility is that the results are driven in part by the fact that different interviewers surveyed different ethnic groups, and that this introduces bias in survey measurement. To address this, in column 6 we include a full set of interviewer fixed effects and the estimates are again similar. Finally, in column 7 we include all controls from columns 1-6 in a single specification. Together, these results build confidence that our findings are driven by the effect of age set organization on inter-generational transfers, and not some omitted household or ethnicity-level characteristic.

B.4. Uganda's Senior Citizen Grant: Estimates that do Not Exploit Household Exposure

Our main analysis exploits differences across extended households in the number of pension recipients. Our triple-difference estimates allow for the inclusion of ethnicity-by-district fixed effects, which we view as important for isolating the effect of pension exposure on households with and without age sets. However, a potential shortcoming of our baseline specification (Equation 5) is that it could be potentially biased if the introduction of the pension program induces differential endogenous changes in household composition between members of societies with and without age sets.

There are several reasons why this should not be a major concern. First, we find that households with and without age sets are balanced across a range of observable measures of household composition in non-pilot districts, including the number and ages of older household members, the number of children, and the ratio between older household members to children (see Table A13, Panel A). These findings are consistent with the fact that even in age set societies, many families live in a series of linked compounds (*manyatta*) and as a result, multiple generations often reside in the same extended household. Second, in our main specification, we control for pension-exposure-by-age-set-organization fixed effects in order to directly and flexibly control for any differences in household composition across ethnic groups. Finally, based on ethnographic accounts, it seems unlikely *ex ante* that the pattern of selection biases the results in the direction of our finding; if anything, the opposite seems more likely. For our estimates to be driven by selection, it would have to be that the pilot program induces grandparents who feel *less* attached to their grandchildren in age set societies compared to societies without age sets to begin co-residing with grandchildren. If anything, since the default in age set societies is that inter-generational ties are weaker, we would expect the pattern of selection to be the opposite.

Nevertheless, to investigate whether our findings are driven by our measured variation in household composition, we present estimates from an alternative specification that only exploits district and ethnicity-level variation, and hence does not depend on household composition. The estimating equation is:

$$y_{ih} = \beta \cdot \left(\mathbb{I}_{d(h)}^{\text{Pilot}} \cdot \mathbb{I}_{e(h)}^{\text{NoAgeSet}} \right) + \gamma \cdot \mathbb{I}_{d(h)}^{\text{Pilot}} + \alpha_e + \mathbf{X}'\Gamma + \epsilon_{ih} \tag{8}$$

[38] In order to have as large a sample as possible, we also include a fixed effect for each variable that indicates when the value is missing in the *Ethnographic Atlas*. Our measurement of each ethnicity-level characteristic is described in Appendix Section A.2.

where i indexes individuals, h indexes households, and $d(h)$ and $e(h)$ represent the district of residence and ethnicity of household h. The coefficient β captures the effect of being in a pilot district (compared to non-pilot) district, in a kin-based society (compared to an age set society). Our hypothesis now is simply that in districts that receive the pension pilot, children from kin-based societies should be relatively better off on average. Our estimates of β are reported in Figure A9 and are qualitatively very similar to our baseline estimates, whether child nutrition is measured as the weight-for-height percentile or as an indicator that equals one if the child is below the fifth percentile. While these estimates are necessarily less precise since we rely on coarser variation, we estimate that $p < 0.1$ in all of the specifications and $p < 0.05$ in two thirds of the specifications. These estimates suggest that the baseline findings are not driven by endogenous shifts in household composition that differs between societies with and without age sets.

B.5. Uganda's Senior Citizen Grant: Older Children

This section investigates the impact of Uganda's pension program on outcomes for older children, separately in societies with and without age sets. We estimate versions of Equation 5 in which the dependent variable is either secondary school attendance or marriage status of children aged 15-18. Regression estimates are reported in Table A20 and tripe-difference estimates ($\beta_1 - \beta_2$), capturing the difference in the effect of the pension program in kin-based versus age-based societies, are reported in Figure A11. Figure A11 is structured in the same way as Figure 11 from the main text.

Mirroring our findings on primary school attendance, we estimate a positive effect on school attendance for boys in kin based societies and zero effect in age set societies (Table A20, column 1). The triple difference estimate, however, is less precise in this older sample and not statistically distinguishable from zero (Figure A11a, middle column).

Strikingly, we also find a significant *negative* effect of the pension program on school attendance for girls in kin-based societies (Table A20, column 3). The decline in girls' *schooling* can largely be accounted for by an increase in *marriage*—girls from households that receive pension grants are more likely to be married in kin-based compared to age-based societies (column 4). We find no effect on girls' education or marriage in age set societies, consistent with our findings throughout that children are unaffected by pension grants in age set societies. In the case of girls' education and marriage, the triple-difference estimates are highly statistically significant (Figure A11).

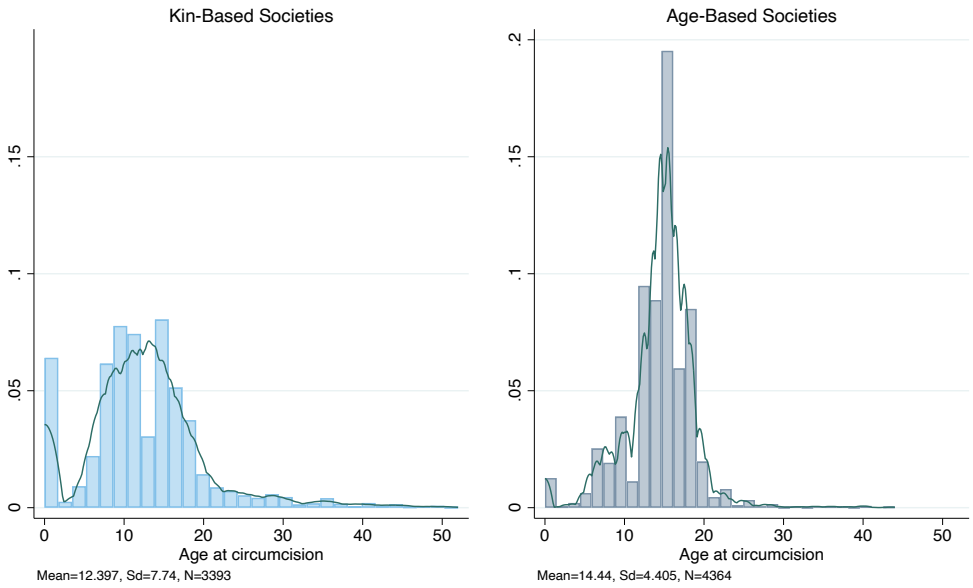
Marriage in rural Uganda is often arranged by a girl's household and extended family (Green et al., 2009, p. 5), and having married daughters is of substantial social importance. This is driven in part by the fact that early marriage prevents any stigma associated with a potential pre-marital pregnancy and, according to many parents, limits the likelihood of HIV exposure (Green et al., 2009, pp. v, 12).[39] For the family, therefore, there is a trade off between the social value of having married daughters and the potential economic costs of losing household labor (Bantebya et al., 2014). Thus, it appears that when older members of households in kin-based societies receive pension grants, the influx of resources frees the family to marry daughters living in the household. This increases the likelihood that girls will be married (Figure A11b) and reduces the likelihood that they will be in

[39] Among surveyed parents, early marriage for daughters was widely popular (Green et al., 2009, p. 5).

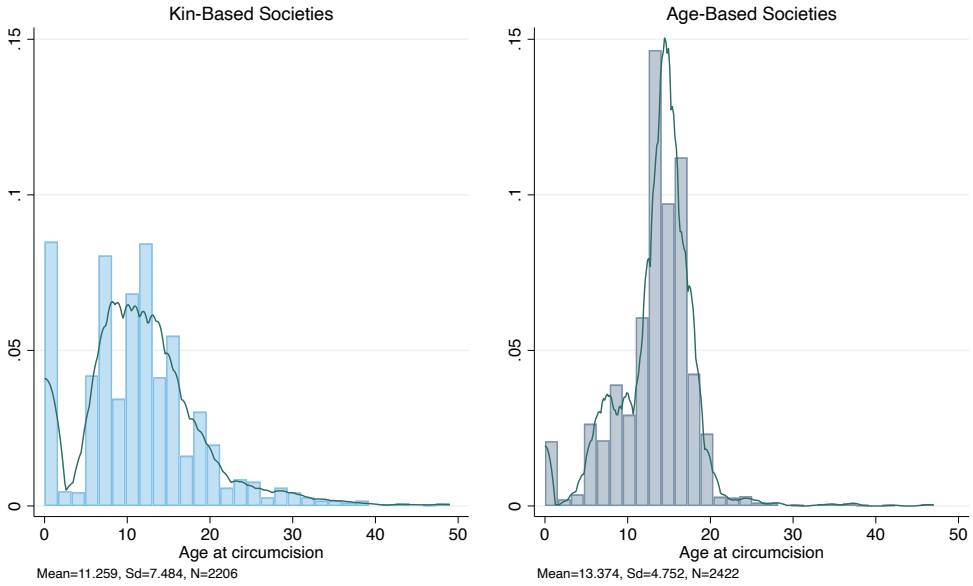
school (Figure A11a).

Thus, across all measurable forms of investment that older generations might make in younger generations when the pension program was introduced, we find strong evidence of inter-generational ties in kin-based societies but no evidence of such ties in age set societies. This pattern even seems to extend to older children (i.e., teenagers in secondary school and making marriage decisions).

C. Supplementary Figures and Tables

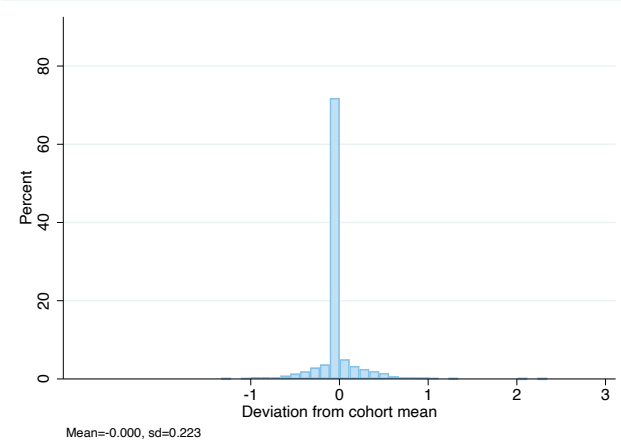


(a) Rural Sample

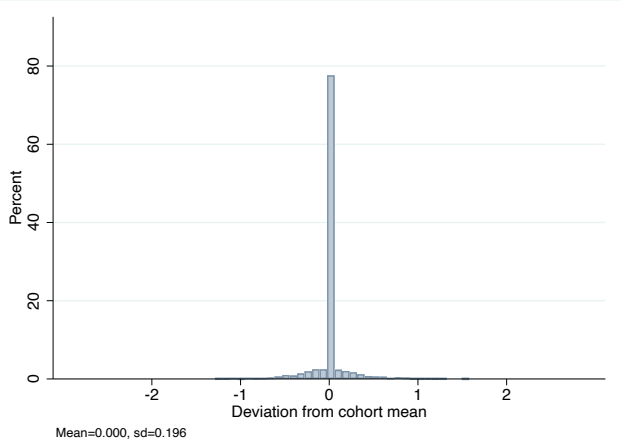


(b) Urban Sample

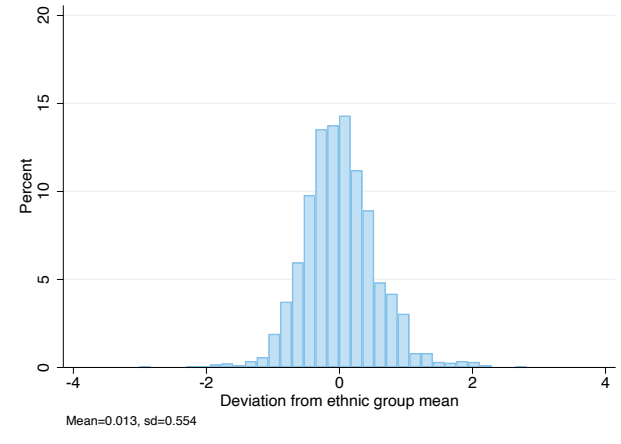
Figure A1: **Circumcision Age in Age Set and Kin-Based Societies: Rural vs. Urban.** Figure A1a displays the histogram of the age of circumcision for all males in the sample of rural households while Figure A1b displays the same for urban households. The mean and standard deviation of each distribution is reported at the bottom of each histogram. Data are from the 2014 and 2016 DHS surveys for Kenya and Uganda respectively.



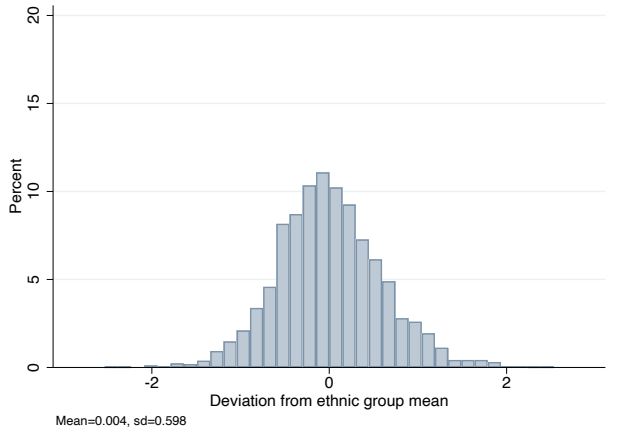
(a) Cohort Deviation: Kin



(b) Cohort Deviation: Age Set



(c) Outside Cohort Deviation: Kin



(d) Outside Cohort Deviation: Age Set

Figure A2: **Consumption Deviations: Age Set vs. Kin.** Figures A2b and A2a display the distribution of expenditure deviation from the main provider's age cohort average for members of societies with and without age sets. Figures A2d and A2c display the distribution of expenditure deviation from the average across members of the same village and ethnicity but outside the age cohort of the main provider for members of societies with and without age sets. Data are from the 2014 and 2016 DHS surveys for Kenya and Uganda respectively.

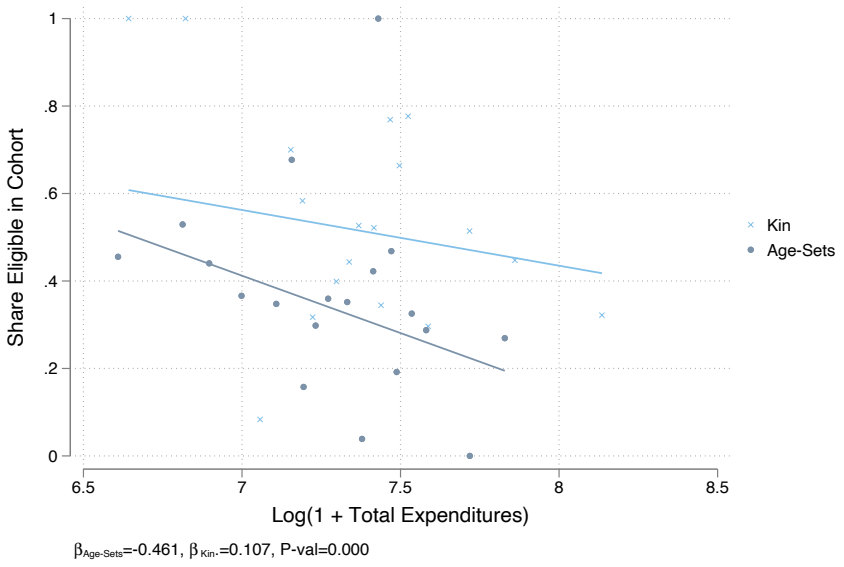
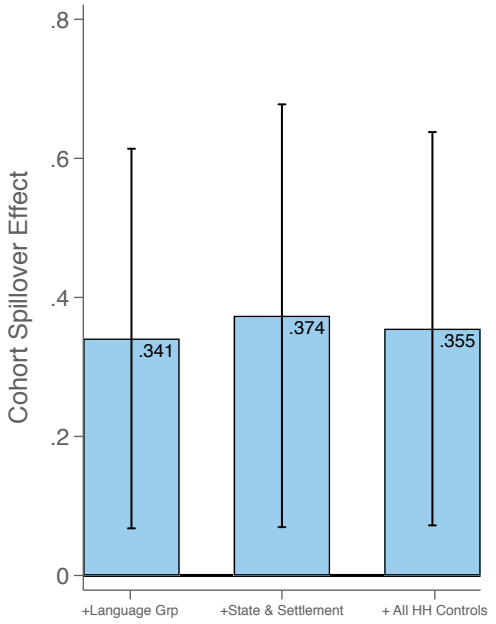
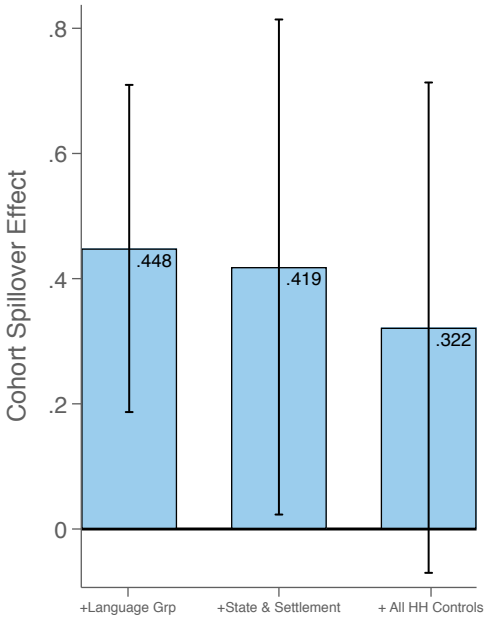


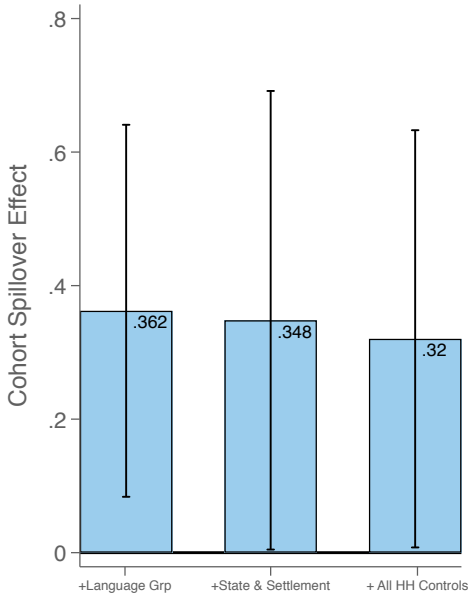
Figure A3: **Consumption and Cohort HSNP Eligibility.** Binscatter plots of (log of) household consumption expenditure (x-axis) vs. the share of cohort members of the main providers who are HSNP eligible (y-axis) for the sample of non-beneficiaries. The relationship is plotted separately for members of kin-based societies (light blue crosses) and age set societies (dark blue circles). We also report the p-value of the difference between the two slopes (p<0.01).



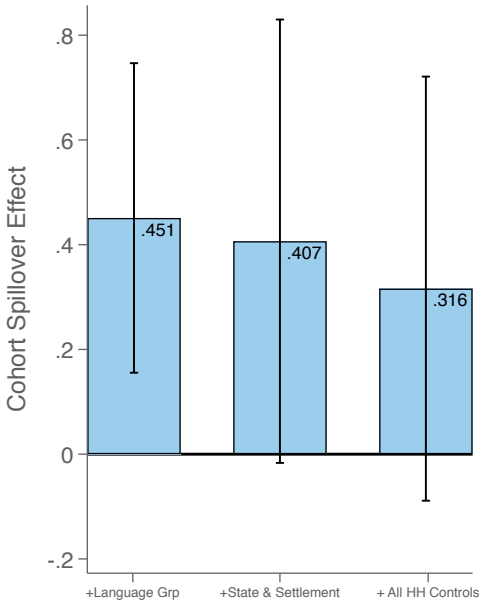
(a) Total Expenditure, Full Sample



(b) Food Expenditure, Full Sample

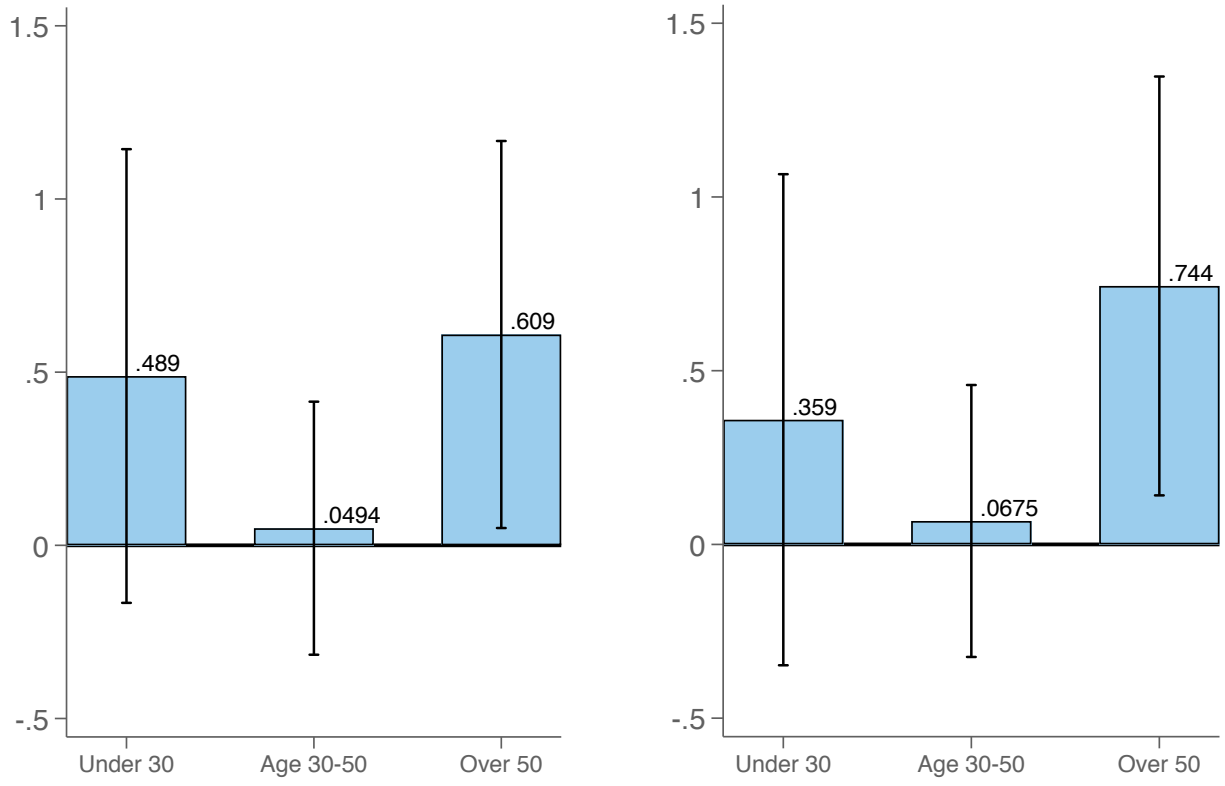


(c) Total Expenditure, Males Only



(d) Food Expenditure, Males Only

Figure A4: **Controlling for Ethnicity-Level Characteristics: Cohort Spillovers in Kenya's HSNP.** Each bar reports an estimate of $\gamma_1 - \gamma_2$ from Equation 2. The leftmost column of each sub-figure controls for language group fixed effects and appropriate interactions; the middle column adds fixed effects in ethnicity-level settlement complexity and jurisdictional hierarchy beyond the local community and appropriate interactions; the third column adds to these the full set of baseline household-level controls. The dependent variable and sample used for each specification is noted in each sub-figure's caption. Standard errors are clustered by sub-location and 95% confidence intervals are reported.

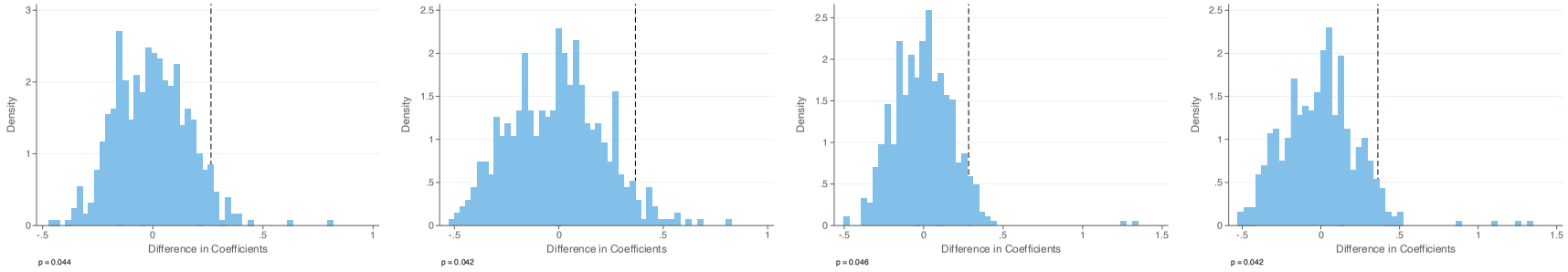


(a) Total Expenditure

(b) Food Expenditure

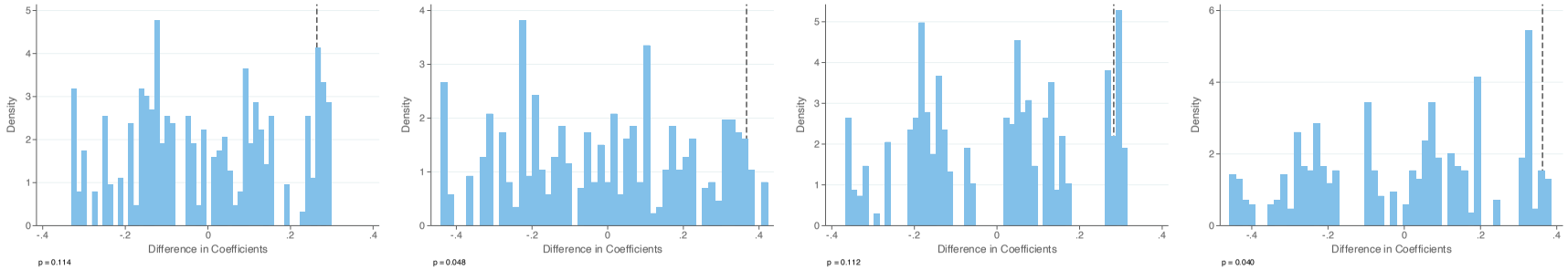
Figure A5: **Heterogeneous Effects By Generation: Cohort Spillovers in Kenya's HSNP.** Estimates of the coefficient of interest from Equation 2, estimated separately on a sample of main providers under 30 years old, from 30-50 years old, and over 50 years old. In Figure A5a, the y-axis measures (log of) total expenditure while in Figure A5b, it measures (log of) food expenditure. Standard errors are clustered by sub-location and 95% confidence intervals are reported.

Panel A: Randomization With Replacement



(a) Full Sample, All Spending ($p = 0.044$) (b) Males, All Spending ($p = 0.042$) (c) Full Sample, Food ($p = 0.046$) (d) Males, Food ($p = 0.042$)

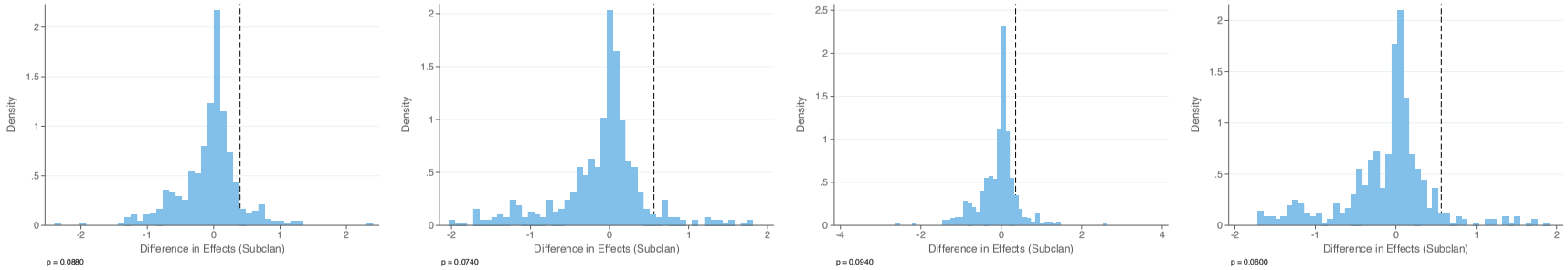
Panel B: Randomization Without Replacement



(e) Full Sample, All Spending ($p = 0.114$) (f) Males, All Spending ($p = 0.048$) (g) Full Sample, Food ($p = 0.112$) (h) Males, Food ($p = 0.040$)

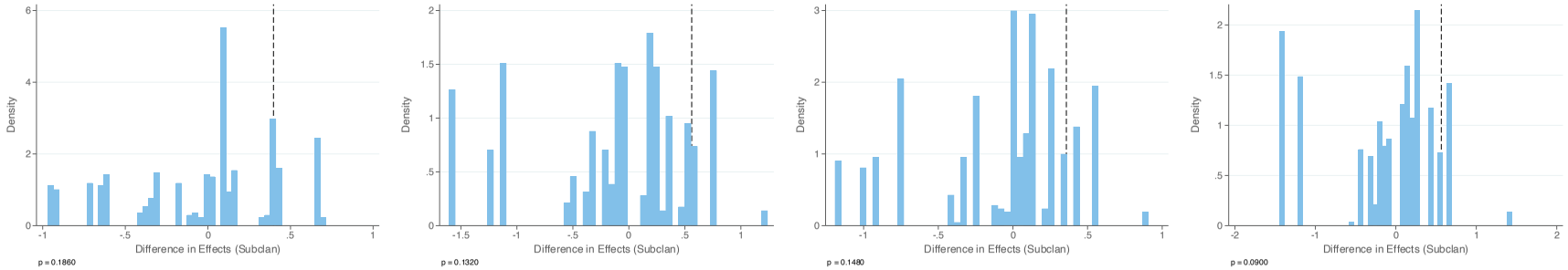
Figure A6: **Kenya's HSNP and Age Set Spillovers: Randomization Inference.** Each sub-figure reports the results from a randomization inference test, corresponding to Equation 2 in the main text. The blue histogram displays the distribution of placebo estimates of $\gamma_1 - \gamma_2$ and the black dashed line is our actual estimate from the corresponding specification. In Panel A, the social structure categorization is randomized across ethnic groups with replacement, and in Panel B it is randomized across ethnic groups without replacement. Figures A6a and A6d correspond to the specification using the full sample and total spending as the dependent variable. Figures A6b and A6f correspond to the specification using the males-only sample and total spending as the dependent variable. Figures A6c and A6g correspond to the specification using the full sample and food spending as the dependent variable. Figures A6d and A6h correspond to the specification using the males-only sample and food spending as the dependent variable.

Panel A: Randomization With Replacement



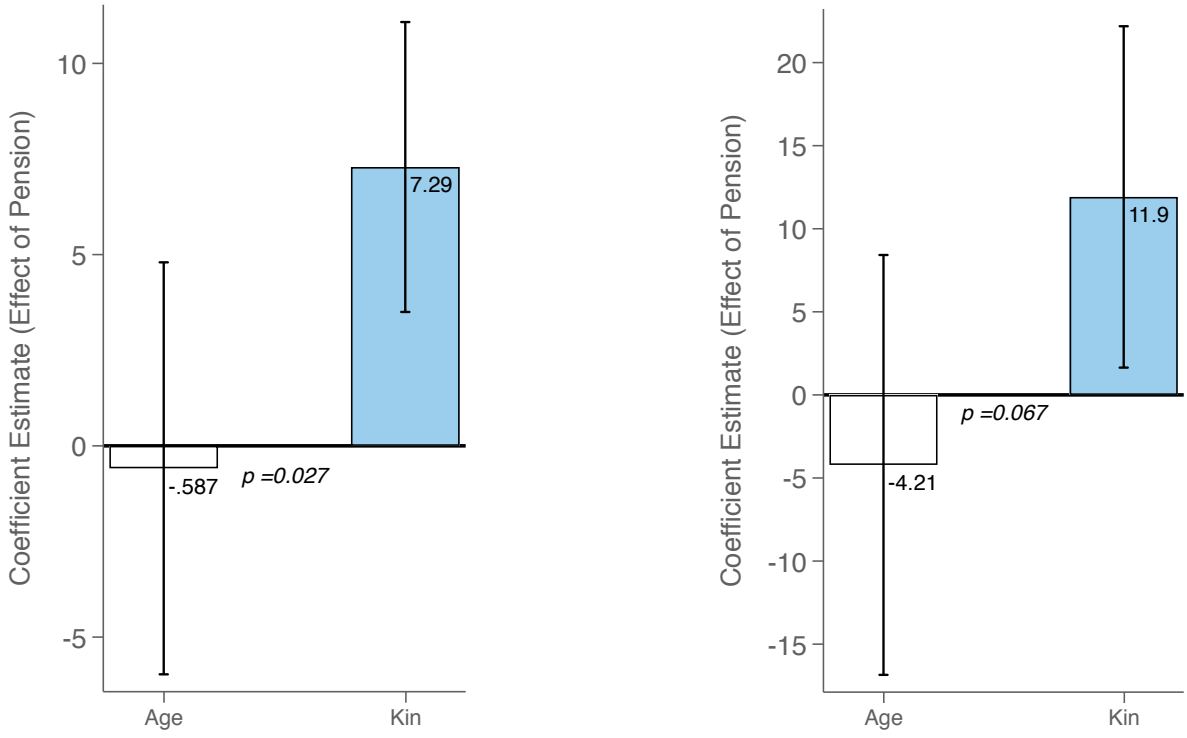
(a) Full Sample, All Spending ($p = 0.088$) (b) Males, All Spending ($p = 0.074$) (c) Full Sample, Food ($p = 0.094$) (d) Males, Food ($p = 0.060$)

Panel B: Randomization Without Replacement



(e) Full Sample, All Spending ($p = 0.186$) (f) Males, All Spending ($p = 0.132$) (g) Full Sample, Food ($p = 0.112$) (h) Males, Food ($p = 0.090$)

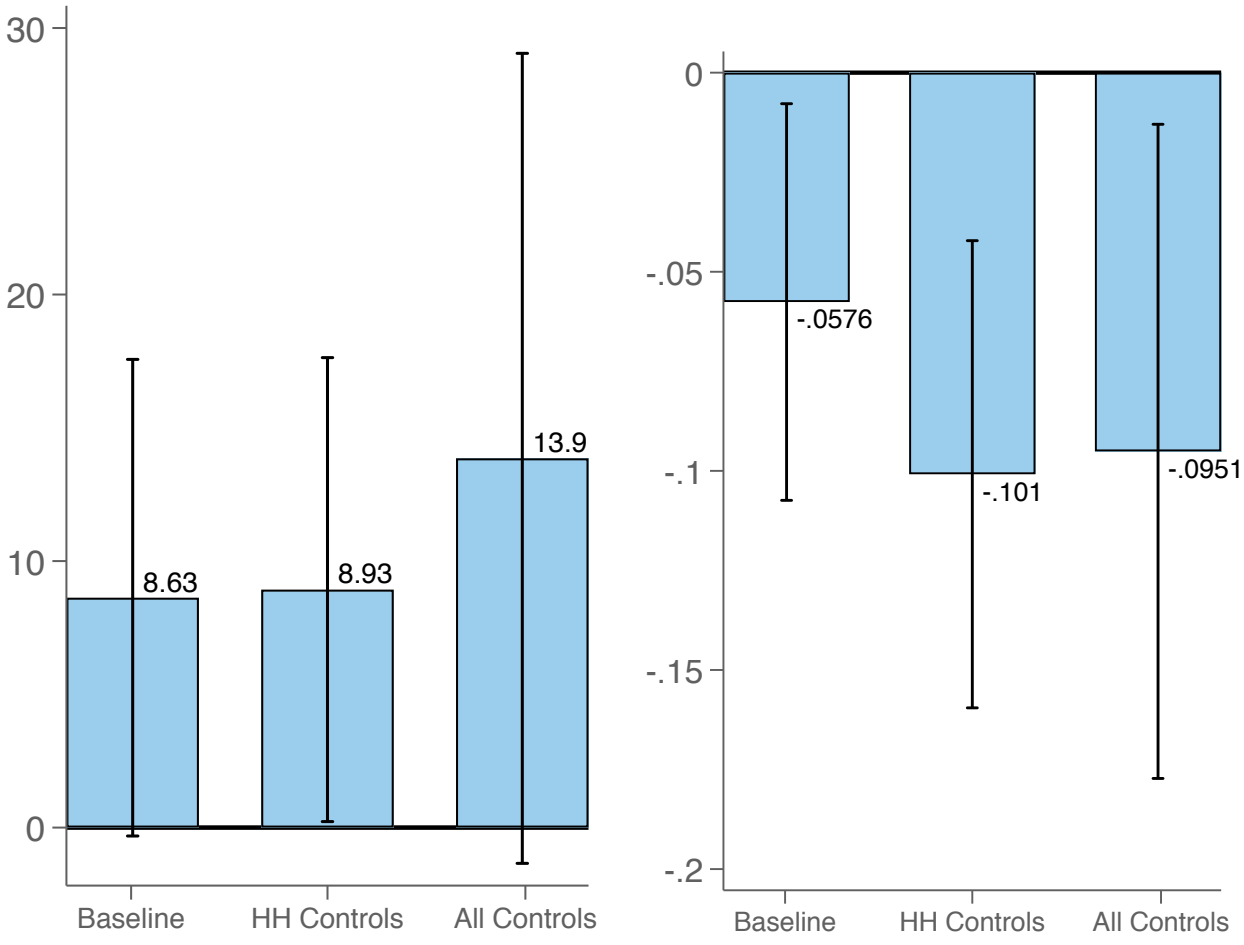
Figure A7: **Kenya's HSNP and Subclan Spillovers: Randomization Inference.** Each sub-figure reports the results from a randomization inference test, corresponding to the analysis of sub-clan-level spillovers the main text (Table 3). The blue histogram displays the distribution of placebo estimates of the difference between the effect of subclan transfers in kin-based vs. age-based societies, and the black dashed line is our actual estimate from the corresponding specification. In Panel A, the social structure categorization is randomized across ethnic groups with replacement, and in Panel B it is randomized across ethnic groups without replacement. Figures A7a and A7d correspond to the specification using the full sample and total spending as the dependent variable. Figures A7b and A7f correspond to the specification using the males-only sample and total spending as the dependent variable. Figures A7c and A7g correspond to the specification using the full sample and food spending as the dependent variable. Figures A7d and A7h correspond to the specification using the males-only sample and food spending as the dependent variable.



(a) Weight-For-Height: Full Sample

(b) Weight-For-Height: Male Children

Figure A8: **Pension Grants and Child Nutrition in Kenya's HSNP: Controlling for Household-Level Wealth.** Each sub-figure reports estimates of Equation (3); the left column reports ξ_1 and the right column ξ_2. The dependent variable is listed at the bottom of each graph. All specifications include interviewer fixed effects, age-by-ethnicity fixed effects, the full set of baseline controls, and a household-level wealth index reported by the HSNP evaluation. Standard errors are clustered by sub-location and 95% confidence intervals are reported.

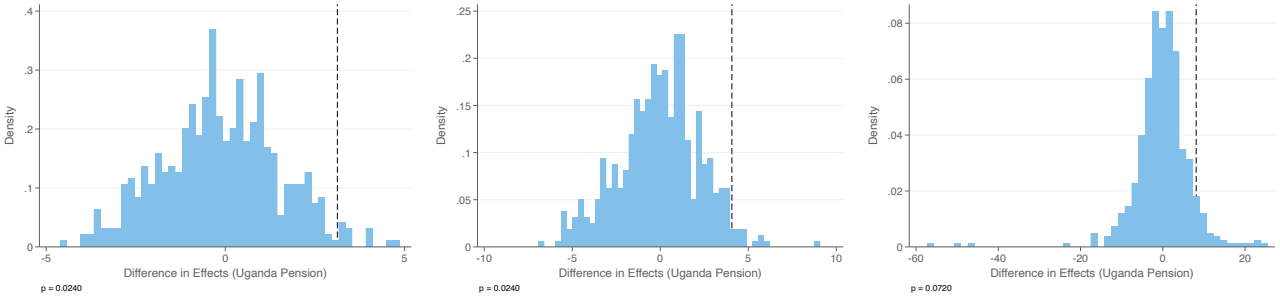


(a) Double Difference: WFH Percentile

(b) Double Difference: WFH Bottom 5% Indicator

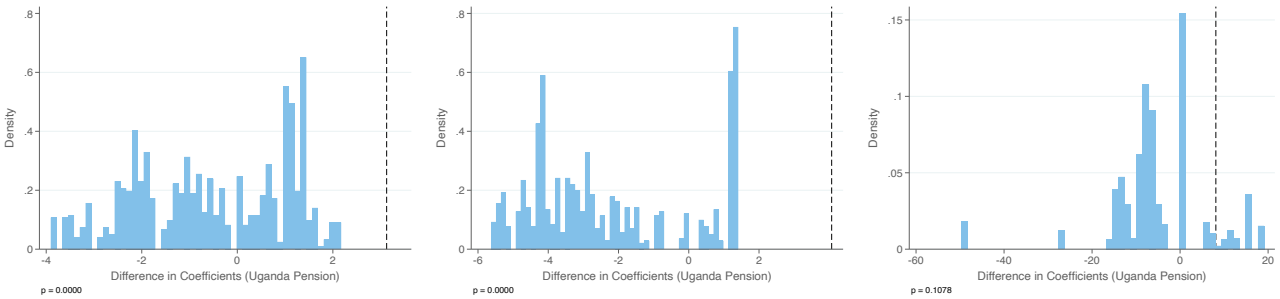
Figure A9: **Uganda's Pension Pilot and Child Nutrition: Double Difference Estimates.** In Figure A9a the dependent variable is child weight-for-height percentile and in Figure A9b it is an indicator that equals one if the child falls below the 5th percentile. Each column reports the coefficient estimate of the difference in the effect of being in a pension pilot district on households in kin-based vs. age-based societies. The leftmost column includes only the baseline controls: ethnicity fixed effects, age-by-sex fixed effects, interviewer fixed effects, and a pilot district indicator. The middle column also includes the expanded set of household-level controls and the right column includes the full set of ethnicity-level controls. 95% confidence intervals are reported.

Panel A: Randomization With Replacement



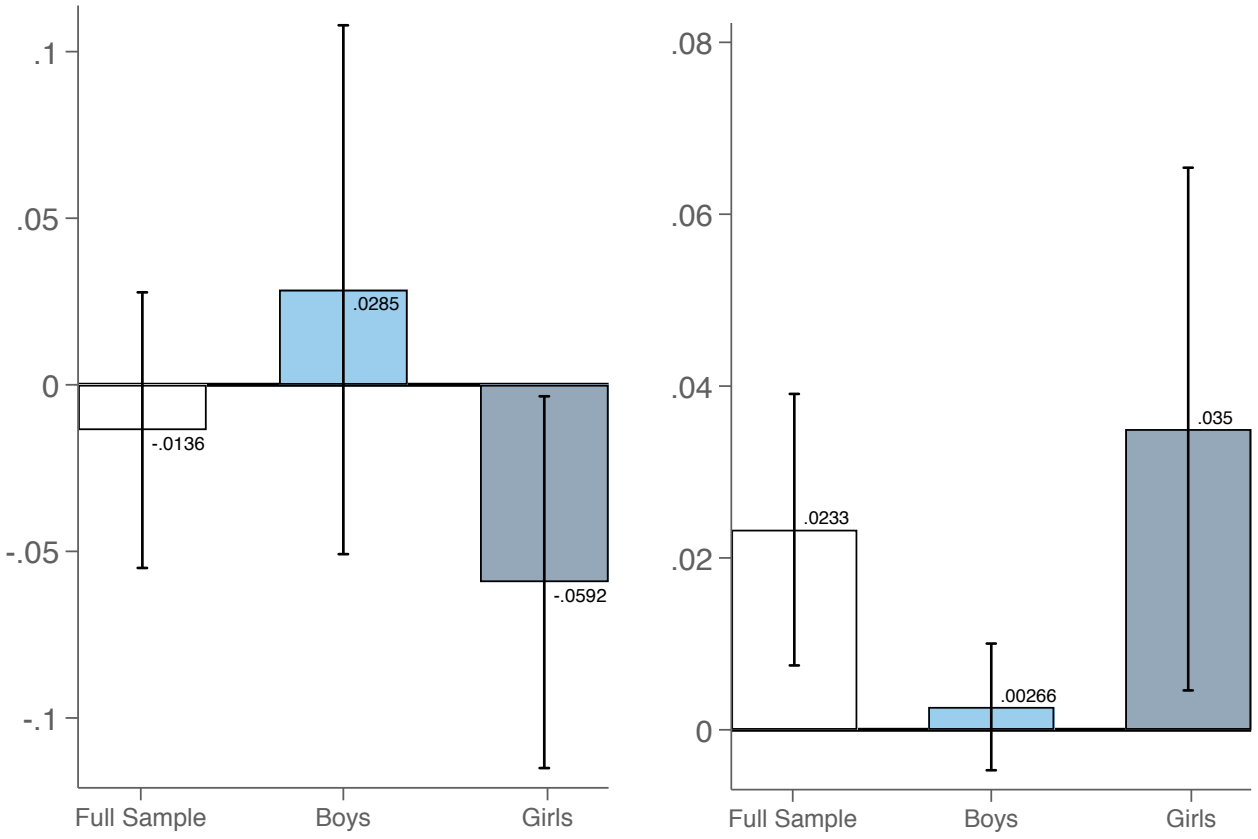
(a) Baseline ($p = 0.0240$) (b) All Controls ($p = 0.0240$) (c) Boys Only ($p = 0.0720$)

Panel B: Randomization Without Replacement



(d) Baseline ($p < 0.000$) (e) All Controls ($p < 0.000$) (f) Boys Only ($p = 0.1078$)

Figure A10: **Uganda's Pension Pilot and Child Nutrition: Randomization Inference.** Each sub-figure reports the results from a randomization inference test, corresponding to Equation 5 reported in Table 4 in the main text. The blue histogram displays the distribution of placebo estimates of $\beta_1 - \beta_2$ and the black dashed line is our actual estimate from the corresponding specification. In Panel A, the social structure categorization is randomized across ethnic groups with replacement, and in Panel B it is randomized across ethnic groups without replacement. Figures A10a and A10d correspond to the baseline specification (column 1 of Table 4). Fiigures A10b and A10e correspond to the specification that includes all controls (column 2 of Table 4); and Figures A10c and A10f correspond to the specification that restricts the sample only to boys (column 5 of Table 4).



(a) Secondary School Attendance

(b) Marriage

Figure A11: **The Effects of Uganda's Pension Program on Older Children.** Each column reports the differential effect of pension exposure on households from kin-based vs. age-based societies ($\beta_1 - \beta_2$). In A11a, the dependent variable is an indicator that equals one if a secondary school age child is attending school, and in Figure A11b, it is an indicator that equals one if the child is married. Moving from left to right, the sample in each specification includes (i) all children 15-18, (ii) male children 15-18, and (iii) female children 15-18. Standard errors are clustered by district and 95% confidence intervals are reported.

Table A4: Correlations between age set organization and other ethnicity-level characteristics

(1) Variable Name	(2) Sample Mean	(3) Age Set vs. Kin	(4) Variable Name	(5) Sample Mean	(6) Age Set vs. Kin
Panel A:Conflict and Herding					
Pastoralism dependence, 0-1	3.552	0.307	Pre-colonial Conflict	0.0690	-0.0838
		(0.814)			(0.0605)
asinh(Conflicts), ACLED	5.339	-0.283	asinh(Conflicts), Excl. Riots, ACLED	5.199	-0.147
		(0.563)			(0.576)
asinh(Deaths), ACLED	4.605	0.0575	asinh(Conflicts), UCDP-GED	4.087	0.583
		(0.498)			(0.596)
Panel B: Transfer of Leadership					
Local Leader Elected, 0/1	0.174	-0.267	Hereditary Local Leadership, 0/1	0.522	-0.333
		(0.375)			(0.292)
Panel C: Marriage and the Role of Women					
Polygamous, 0/1	0.966	0.0419	No Cousin Marriage, 0/1	0.455	-0.282
		(0.0435)			(0.256)
Bride Price Practiced, 0/1	0.207	0.276	Plow Used Historically, 0/1	0.0690	0.132
		(0.177)			(0.0908)
Inheritance Rule for Land, 0/1	0.913	-0.180	Patrilocal, 0/1	0.931	0.0838
		(0.136)			(0.0605)
Women Do Not Inherit Land, 0/1	0.826	0.270	Women Participate Less in Ag. 0/1	0.174	-0.124
		(0.167)			(0.0955)
Panel D: Pre-Colonial Development					
Jurisd. hierarchy (local), 1-5	1.607	-0.191	Jurisd. hierarchy (beyond local), 1-5	2.607	-0.845
		(0.220)			(0.289)
Settlement pattern complexity, 1-8	4.586	-0.219			
		(0.606)			

Notes: The unit of observation is an ethnic group. There are 29 ethnic groups in our sample from Uganda and Kenya, although the sample size varies slightly across specifications due to missing values in the ethnographic data. Columns 1 and 4 report the ethnicity-level characteristics. Columns 2 and 5 report the sample mean of each measure and columns 3 and 6 report the difference in the characteristic between societies with and without age sets. In each case, the dependent variable is the reported ethnicity-level characteristic and the right hand side includes the age set indicator and a Kenya indicator. The ACLED conflict data are measured from 1997-2010 and the UCDP conflict data are measured from 1989-2010. The pastoralism measure is computed as in Becker (2019) and the pre-colonial conflict data are from Besley and Reynal-Querol (2014). The remaining variables are from the Ethnographic Atlas. Robust standard errors are reported in parentheses.

Table A5: Age Cohort Spillover Effects On Expenditure: Cohort of the Household Heads and Main Providers

	(1) Full Sample	(2) Males Only	(3) Full Sample	(4) Males Only
	Household Head		Main Provider & Hh Head	
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.246	0.329	0.266	0.344
	(0.110)	(0.112)	(0.119)	(0.121)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	0.0423	0.0287	0.0538	0.0277
	(0.0861)	(0.0891)	(0.0925)	(0.0945)
Observations	685	577	621	546
R-squared	0.599	0.627	0.616	0.626
Interviewer FE	Yes	Yes	Yes	Yes
Targeting Code X Ethnicity FE	Yes	Yes	Yes	Yes
Age FE	Yes	Yes	Yes	Yes
Age Set X Share eligible in age cohort	Yes	Yes	Yes	Yes
Mean at baseline	7.317	7.344	7.337	7.356
P-val $\gamma_1 = \gamma_2$	0.180	0.0492	0.200	0.0539

Notes: The unit of observation is a household. In columns 1-2, we assign each household to the age cohort of the household head and in columns 3-4 we assign each household to the cohort-level shock including both the cohort of the main provider and the cohort of the household head. Columns 1 and 3 include the full sample and columns 2 and 4 restrict the sample to male household heads or main providers. The dependent variable is log of per capita monthly food spending. $\mathbb{I}^{\text{Age Set}}$ is an indicator variable that equals one if the respondent belongs to an age set society and $\mathbb{I}^{\text{Kin}}$ an indicator variable that equals one if the respondent belongs to a kin-based society. $\mathbb{I}^{\text{Treat}}$ is an indicator variable that equals one if the respondent is in the treatment group. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are clustered at the sub-location level.

Table A6: Age Cohort Spillover Effects On Spending: Excluding Households with Savings

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Log Total Consumption Spending				Total Cons. Spending
			Panel A: Full Sample		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.247	0.306	0.279	0.285	2566.7
	(0.0987)	(0.120)	(0.114)	(0.126)	(1054.7)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.00276	0.0423	0.0424	0.0662	-305.7
	(0.0791)	(0.0863)	(0.0773)	(0.0781)	(705.7)
p-value, $\gamma_1 = \gamma_2$	0.066	0.082	0.104	0.157	0.025
R-Squared	0.476	0.633	0.705	0.706	0.697
Observations	626	559	559	556	556
			Panel B: Males Only		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.344	0.445	0.370	0.396	4051.3
	(0.110)	(0.137)	(0.136)	(0.152)	(1487.6)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.00573	0.0492	0.0666	0.0774	-223.0
	(0.0742)	(0.0927)	(0.0811)	(0.0891)	(795.8)
p-value, $\gamma_1 = \gamma_2$	0.014	0.015	0.060	0.071	0.014
R-Squared	0.498	0.670	0.723	0.728	0.707
Observations	524	468	468	465	465
Interviewer FE	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	No	Yes	Yes	Yes	Yes
Additional Controls	No	No	Yes	Yes	Yes
Age Set x Share Eligible in Age Cohort	No	No	No	Yes	Yes

Notes: The unit of observation is a household. In Panel A, we include the full sample of non-beneficiary households and in Panel B we include only households with a male main provider. The dependent variable is log of per capita monthly spending in columns 1-4 and raw per-capita monthly food spending in column 5. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Households with any savings at baseline are excluded from the analysis. Standard errors are clustered at the sub-location level.

Table A7: Age Cohort Spillover Effects On Expenditure: Robustness to Excluding Each Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable is log Total Consumption Spending							
Excluded Group:	Borana	Burji	Gabra	Garre	Rendille	Samburu	Somali	Turkana
				Panel A: Full Sample				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.265	0.258	0.261	0.273	0.203	0.281	0.269	0.173
	(0.129)	(0.107)	(0.114)	(0.112)	(0.109)	(0.112)	(0.107)	(0.107)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	0.0141	-0.0148	-0.00519	-0.0328	-0.00464	-0.00615	0.0674	-0.0381
	(0.0741)	(0.0774)	(0.0762)	(0.0843)	(0.0761)	(0.0762)	(0.145)	(0.0753)
p-value, $\gamma_1 = \gamma_2$	0.0987	0.0483	0.0648	0.0357	0.134	0.0433	0.296	0.125
R-squared	0.459	0.465	0.473	0.471	0.474	0.469	0.423	0.529
				Panel B: Males Only				
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.351	0.364	0.351	0.400	0.334	0.416	0.386	0.222
	(0.139)	(0.115)	(0.123)	(0.120)	(0.125)	(0.119)	(0.119)	(0.109)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	0.0147	-0.0122	-0.00107	-0.0247	-0.00268	-0.00255	0.0727	-0.0347
	(0.0697)	(0.0732)	(0.0724)	(0.0808)	(0.0720)	(0.0724)	(0.141)	(0.0729)
p-value, $\gamma_1 = \gamma_2$	0.0359	0.00936	0.0193	0.00535	0.0271	0.00485	0.124	0.0621
R-squared	0.471	0.481	0.497	0.492	0.483	0.487	0.461	0.535
Observations	636	705	676	635	643	696	454	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The unit of observation is a household and the dependent variable is log of total consumption spending. Panel A includes the full sample and Panel B restricts the sample to male main providers. Each column excludes members of a different ethnic group from the sample, and the excluded group is noted at the top of each column. Standard errors are clustered at the sub-location level.

Table A8: Age Cohort Spillover Effects On Food Expenditure: Robustness to Excluding Each Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent Variable is log Food Spending							
Excluded Group:	Borana	Burji	Gabra	Garre	Rendille	Samburu	Somali	Turkana
	Panel A: Full Sample							
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.295	0.273	0.270	0.287	0.229	0.283	0.283	0.191
	(0.121)	(0.100)	(0.107)	(0.105)	(0.0988)	(0.105)	(0.101)	(0.111)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.0242	-0.0506	-0.0472	-0.0642	-0.0465	-0.0476	-0.0434	-0.0791
	(0.0876)	(0.0904)	(0.0886)	(0.0943)	(0.0883)	(0.0887)	(0.146)	(0.0897)
p-value, $\gamma_1 = \gamma_2$	0.0377	0.0226	0.0294	0.0167	0.0465	0.0217	0.0893	0.0712
R-squared	0.358	0.366	0.373	0.363	0.366	0.365	0.329	0.442
	Panel B: Males Only							
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Age Set}}$	0.392	0.385	0.360	0.423	0.365	0.418	0.404	0.251
	(0.135)	(0.113)	(0.118)	(0.116)	(0.112)	(0.120)	(0.117)	(0.129)
Share eligible in age cohort * $\mathbb{I}^{\text{Treat}}$ * $\mathbb{I}^{\text{Kin}}$	-0.0172	-0.0400	-0.0358	-0.0453	-0.0373	-0.0369	-0.0434	-0.0695
	(0.0846)	(0.0869)	(0.0853)	(0.0917)	(0.0848)	(0.0854)	(0.148)	(0.0869)
p-value, $\gamma_1 = \gamma_2$	0.0133	0.00460	0.00940	0.00257	0.00656	0.00324	0.0324	0.0449
R-squared	0.370	0.382	0.396	0.382	0.376	0.381	0.363	0.447
Observations	636	705	676	635	643	696	454	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The unit of observation is a household and the dependent variable is log of food spending. Panel A includes the full sample and Panel B restricts the sample to male main providers. Each column excludes members of a different ethnic group from the sample, and the excluded group is noted at the top of each column. Standard errors are clustered at the sub-location level.

Table A9: Age Cohort Spillover Effects on Total Expenditure: Two-way Clustering by Sub-location and Solidarity Group

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Log Total Consumption Spending				Total Cons. Spending
			Panel A: Full Sample		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.258	0.339	0.279	0.287	2481.3
	(0.117)	(0.138)	(0.134)	(0.139)	(1199.9)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.00613	0.00364	0.0218	0.0315	-815.3
	(0.0542)	(0.0793)	(0.0861)	(0.0811)	(641.3)
p-value, $\gamma_1 = \gamma_2$	0.050	0.041	0.117	0.121	0.018
R-Squared	0.471	0.628	0.682	0.684	0.673
Observations	713	646	646	643	643
			Panel B: Males Only		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.365	0.443	0.344	0.377	4076.3
	(0.119)	(0.151)	(0.149)	(0.156)	(1288.9)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.00234	0.0194	0.0487	0.0499	-698.9
	(0.0497)	(0.0844)	(0.0875)	(0.0918)	(767.2)
p-value, $\gamma_1 = \gamma_2$	0.007	0.016	0.092	0.068	0.002
R-Squared	0.487	0.663	0.703	0.710	0.689
Observations	603	548	548	545	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	No	Yes	Yes	Yes	Yes
Additional Controls	No	No	Yes	Yes	Yes
Age Set x Share Eligible in Age Cohort	No	No	No	Yes	Yes

Notes: The unit of observation is a household. In Panel A, we include the full sample of non-beneficiary households and in Panel B we include only households with a male main provider. The dependent variable is log of per capita monthly consumption spending in columns 1-4 and raw per-capita monthly consumption spending in column 5. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are double-clustered at the sub-location level and the "solidarity group" level, where the solidarity groups are defined as the age cohort in age set societies and the sub-clan in kin-based societies.

Table A10: Age Cohort Spillover Effects on Food Expenditure: Two-way Clustering by Sub-location and Solidarity Group

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Log Food Consumption Spending				Food Cons. Spending
			Panel A: Full Sample		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.261	0.373	0.314	0.326	2269.2
	(0.109)	(0.135)	(0.135)	(0.138)	(1037.8)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.0218	0.00949	0.0209	0.0390	-592.4
	(0.0673)	(0.0860)	(0.0843)	(0.0872)	(537.3)
p-value, $\gamma_1 = \gamma_2$	0.035	0.028	0.074	0.083	0.017
R-Squared	0.352	0.550	0.619	0.624	0.591
Observations	713	646	646	643	643
			Panel B: Males Only		
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{AgeSet}$	0.348	0.471	0.385	0.422	3635.4
	(0.117)	(0.157)	(0.167)	(0.172)	(1158.2)
Share eligible in age cohort * $\mathbb{I}^{Treat}$ * $\mathbb{I}^{Kin}$	-0.0146	0.0357	0.0578	0.0747	-287.6
	(0.0585)	(0.0909)	(0.0846)	(0.0976)	(669.6)
p-value, $\gamma_1 = \gamma_2$	0.008	0.019	0.086	0.075	0.005
R-Squared	0.368	0.586	0.639	0.646	0.609
Observations	603	548	548	545	545
Interviewer FE	Yes	Yes	Yes	Yes	Yes
Targeting Code x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Age x Ethnicity FE	No	Yes	Yes	Yes	Yes
Additional Controls	No	No	Yes	Yes	Yes
Age Set x Share Eligible in Age Cohort	No	No	No	Yes	Yes

Notes: The unit of observation is a household. In Panel A, we include the full sample of non-beneficiary households and in Panel B we include only households with a male main provider. The dependent variable is log of per capita monthly food spending in columns 1-4 and raw per-capita monthly food spending in column 5. Additional controls include gender, age, indicators for marriage, employment, disability, educational attainment, and religion, the number of household members, and a poverty index. Standard errors are double-clustered at the sub-location level and the "solidarity group" level, where the solidarity groups are defined as the age cohort in age set societies and the sub-clan in kin-based societies.

Table A11: Pension Receipt and Child Weight-for-Height: Kenya's HSNP

Dependent Variable is Child Weight-For-Height				
	(1)	(2)	(3)	(4)
	Full Sample Under 5		Male Children Only	
	Percentile	Z-Score	Percentile	Z-Score
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Kin}}$	7.874	0.394	12.32	0.478
	(2.386)	(0.164)	(4.199)	(0.261)
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Age Set}}$	1.219	0.0594	-3.810	-0.145
	(2.658)	(0.178)	(4.998)	(0.251)
Interviewer Fixed Effects	Yes	Yes	Yes	Yes
Age x Age Set	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes
Observations	231	231	116	116
R-squared	0.359	0.360	0.440	0.475
Mean at baseline	50.46	-1.228	51.92	-1.193
p-value, coefficient difference	0.0634	0.162	0.0395	0.0997

Notes: The unit of observation is a child under 5 in the pension targeting mechanism group. Baseline controls include gender, education, marriage status, occupation, religion, household size and a poverty index. Standard errors are clustered at the sub-location level.

Table A12: Pension Receipt and Education Spending: Kenya's HSNP

	(1) Log(1+Ed. Spending	(2) Log(Ed Spend/ Tot. Spend)	(3) Log(Food Spend/ Tot. Spend)	(4) Log(Rent Spend/ Tot. Spend)	(5) Log(Health Spend/ Tot. Spend)
			Panel A: Full Sample		
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Kin}}$	0.990	0.968	0.00414	-0.171	0.500
	(0.395)	(0.346)	(0.0186)	(0.0869)	(0.404)
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Age Set}}$	0.135	0.0591	0.0152	-0.143	-0.148
	(0.447)	(0.414)	(0.0221)	(0.169)	(0.338)
R-squared	0.587	0.575	0.619	0.514	0.409
p-value, coefficient difference	0.139	0.0784	0.655	0.901	0.210
			Panel B: Males Only		
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Kin}}$	1.091	1.099	0.00393	-0.108	0.436
	(0.588)	(0.522)	(0.0172)	(0.0856)	(0.441)
$\mathbb{I}^{\text{Treat}} * \mathbb{I}^{\text{Age Set}}$	-0.497	-0.490	0.0156	-0.124	-0.527
	(0.629)	(0.569)	(0.0178)	(0.194)	(0.360)
R-squared	0.584	0.575	0.606	0.556	0.429
p-value, coefficient difference	0.0525	0.0292	0.601	0.945	0.114
Interviewer Fixed Effects	Yes	Yes	Yes	Yes	Yes
Ethnicity x Targeting Code Fixed Effects	Yes	Yes	Yes	Yes	Yes
Age x Age Set	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	Yes	Yes	Yes

Notes: The unit of observation is a household in the pension targeting mechanism group. Baseline controls include gender, education, marriage status, occupation, religion, household size and a poverty index. Panel A includes the full sample of households and Panel B restricts the sample to male main providers. Standard errors are clustered at the sub-location level.

Table A13: Balance: Societies With vs. Without Age Sets in the DHS

(1) Variable Name	(2) Sample Mean	(3) Age Set vs. Kin	(4) Variable Name	(5) Sample Mean	(6) Age Set vs. Kin
Panel A: Household-Level Variables					
Pension Exposure (all years)	0.304	0.099	Pension Exposure (2016)	0.073	0.027
		(0.147)			(0.029)
Pension Exposure (2015)	0.065	0.024	Pension Exposure (2014)	0.059	0.025
		(0.028)			(0.027)
Pension Exposure (2013)	0.059	0.012	Pension Exposure (2012)	0.051	0.011
		(0.032)			(0.032)
Pension Exposure (2011)	0.051	-0.000	Children Under 5	1.662	0.063
		(0.030)			(0.051)
Pension-Years Per Child	0.215	0.028			
		(0.086)			
Panel B: Child-Level Variables					
Weight-for-Height (Percentile)	47.112	0.532	Weight-for-Height (Bottom 5%)	0.060	-0.017
		(2.212)			(0.018)
Weight-for-Age (Percentile)	31.114	1.402	Weight-for-Age (Bottom 5%))	0.220	-0.039
		(3.687)			(0.036)
Height-for-Age (Percentile)	26.336	2.300	Height-for-Age (Percentile)	0.315	0.001
		(4.017)			(0.044)
Pension-Years Per Child	2.410	0.142			
		(0.091)			
Panel C: Child-Level Variables - Heterogeneity by Pension Exposure					
Weight-for-Height (Percentile)	47.112	0.733	Weight-for-Height (Bottom 5%)	0.060	-0.010
		(0.766)			(0.006)
Weight-for-Age (Percentile)	31.114	-0.120	Weight-for-Age (Bottom 5%))	0.220	0.001
		(0.562)			(0.011)
Height-for-Age (Percentile)	26.336	-0.998	Height-for-Age (Percentile)	0.315	-0.002
		(0.717)			(0.011)
Pension-Years Per Child	2.410	0.012			
		(0.033)			

Notes: The unit of observation is a household in Panel A and a child in Panels B and C. The sample is restricted to households and children in non-pilot districts. Columns 1 and 4 report the household or child-level characteristic of interest; columns 2 and 5 report the sample mean of each characteristic; and columns 3 and 6 report the coefficient on the age set indicator (Panels A and B) or the interaction term between the age set indicator and potential pension exposure (Panel C). District and interview month fixed effects are included in all specifications. Standard errors, clustered by ethnicity, are reported in parentheses.

Table A14: Effects of Pension Exposure on Nutrition: Alternative Measures of Exposure

Dependent Variable is Child Weight-for-Height				
	(1)	(2)	(3)	(4)
Measure of Pension Exposure:	Only 2016		Incorporating Child Age	
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Kin}}$	6.247	10.83	1.906	2.481
	(2.432)	(4.505)	(0.844)	(1.095)
Potential Exposure *$\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Age Set}}$	-1.423	-2.505	-0.694	-0.706
	(1.862)	(1.986)	(0.725)	(0.781)
p-value, coefficient difference	0.0126	0.00800	0.0197	0.0209
District x Ethnicity Fixed Effects	Yes	Yes	Yes	Yes
Interview Month Fixed Effects	Yes	Yes	Yes	Yes
Age Set x Potential Exposure Fixed Effects	No	Yes	No	Yes
Age in Months x Gender Fixed Effects	No	Yes	No	Yes
Observations	4,112	4,107	4,112	4,107
R-squared	0.129	0.202	0.129	0.202

Notes: The unit of observation is a child and the sample includes all children in the DHS survey who are less than 60 months of age. The dependent variable is the child's weight-for-height percentile. In columns 1-2, pension exposure is computed using only household composition in 2016, and in columns 3-4 it is computed incorporating child age. Standard errors are clustered at the district level.

Table A15: Effects of Pension Program on Child Nutrition: Alternative Mechanisms and Additional Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent Variable is Child Weight-for-Height (percentile)						
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Kin}}$	3.571	3.505	3.100	4.537	4.832	3.334	5.382
	(1.269)	(1.207)	(1.103)	(1.755)	(1.836)	(1.096)	(2.232)
Potential Exposure *$\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Age Set}}$	-0.881	-0.888	-0.866	-1.347	-2.432	-0.713	-1.956
	(0.968)	(1.009)	(0.934)	(2.012)	(2.045)	(0.908)	(1.654)
p-value, coefficient difference	*0.00611*	*0.00709*	*0.00831*	*0.0298*	*0.0111*	*0.00587*	*0.00870*
Number of Children Fixed Effects	Yes	No	No	No	No	No	Yes
Household Asset Controls	No	Yes	No	No	No	No	Yes
Household Wealth Index Fixed Effects	No	No	Yes	No	No	No	Yes
Ethnicity-Level Controls	No	No	No	Yes	No	No	Yes
Language-Family Controls	No	No	No	No	Yes	No	Yes
Interviewer Fixed Effects	No	No	No	No	No	Yes	Yes
District x Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interview Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Set x Potential Exposure Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age in Months x Gender Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,107	4,104	4,107	4,107	4,107	4,100	4,097
R-squared	0.206	0.219	0.205	0.204	0.204	0.224	0.246
p-value	0.00611	0.00709	0.00831	0.0298	0.0111	0.00587	0.00870

Notes: The unit of observation is a child and the sample includes all children in the DHS survey who are less than 60 months of age. The dependent variable is the child's weight-for-height percentile. Household asset controls include indicators for the presence of electricity, radio, television, a refrigerator, a bicycle, a motorcycle, and a car or truck, as well as fixed effects for main floor material, main roof material, main wall material, the type of toilet facility, and the number of rooms used for sleeping. The household wealth index is an index computed by the DHS that ranges from 1-5. Ethnicity level controls include fixed effects for the number of levels of jurisdictional hierarchy beyond the local community and the ethnic group's settlement pattern complexity, along with their full set of interactions. Language family fixed effects include each group's language family from the Ethnographic Atlas (v99), along with their full set of interactions. Standard errors are clustered at the district level.

Table A16: Effects of Pension Exposure on Nutrition: Alternative Measures of Nutrition

Dep Var:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Weight-for-Height:			Weight-for-Age:			Height-for-Age:			PCA
	Percentile	Z-Score	Bottom 5% Indicator	Percentile	Z-Score	Bottom 5% Indicator	Percentile	Z-Score	Bottom 5% Indicator	First PC
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Kin}}$	3.135	0.115	-0.0276	2.091	0.0924	-0.0400	0.751	0.0177	-0.0205	0.171
	(1.098)	(0.0444)	(0.00884)	(1.235)	(0.0363)	(0.0115)	(1.213)	(0.0282)	(0.0126)	(0.0617)
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Age Set}}$	-0.933	-0.0421	0.0302	-1.083	-0.0154	0.0278	0.272	0.0383	-0.0144	-0.0609
	(0.951)	(0.0390)	(0.0199)	(0.784)	(0.0326)	(0.0195)	(1.105)	(0.0515)	(0.0189)	(0.0654)
District x Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interview Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age Set x Potential Exposure Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age in Months x Gender Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,107	4,050	4,107	4,068	4,012	4,068	4,068	4,012	4,068	4,012
R-squared	0.203	0.194	0.134	0.256	0.239	0.165	0.229	0.221	0.191	0.240
p-value, coefficient difference	*0.00659*	*0.00958*	*0.0105*	*0.0322*	*0.0338*	*0.00380*	*0.767*	*0.726*	*0.787*	*0.0137*

Notes: The unit of observation is a child and the sample includes all children in the DHS survey who are less than 60 months of age. The dependent variable from each regression is noted at the top of each column. In column 10, the dependent variable is the first principal component from a principal components analysis including the dependent variables from columns 1-9. Standard errors are clustered at the district level.

Table A17: Effects of Pension Program on Child Height: Heterogeneity by Age

	(1)	(2)	(3)
	Panel A: Height-for-Age (percentile)		
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Kin}} * \mathbb{I}^{\text{Young}}$	4.986	6.820	6.476
	(1.456)	(1.719)	(1.840)
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Age Set}} * \mathbb{I}^{\text{Young}}$	0.452	1.071	0.949
	(2.796)	(2.838)	(2.884)
p-value, coefficient difference	0.163	0.085	0.097
R-Squared	0.378	0.392	0.408
Observations	3841	3841	3839
	Panel B: Height-for-Age (Bottom 5% Indicator)		
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Kin}} * \mathbb{I}^{\text{Young}}$	-0.0117	-0.00199	-0.0107
	(0.0478)	(0.0497)	(0.0516)
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Age Set}} * \mathbb{I}^{\text{Young}}$	0.0100	0.00460	0.00279
	(0.0447)	(0.0500)	(0.0567)
p-value, coefficient difference	0.743	0.926	0.863
R-Squared	0.343	0.362	0.381
Observations	3841	3841	3839
	Panel C: Height-for-Age (z-score)		
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Kin}} * \mathbb{I}^{\text{Young}}$	11.92	14.95	13.60
	(7.450)	(6.583)	(7.214)
Potential Exposure * $\mathbb{I}^{\text{Pilot}} * \mathbb{I}^{\text{Age Set}} * \mathbb{I}^{\text{Young}}$	-0.231	2.855	1.631
	(11.25)	(11.65)	(12.71)
p-value, coefficient difference	0.378	0.369	0.421
R-Squared	0.365	0.383	0.399
Observations	3789	3789	3788
District x Ethnicity FE x $\mathbb{I}^{\text{Young}}$	Yes	Yes	Yes
Interview month x Age x Gender FE	Yes	Yes	Yes
Pension Years FE x $\mathbb{I}^{\text{Age-Set}}$ x $\mathbb{I}^{\text{Young}}$	Yes	Yes	Yes
$\mathbb{I}^{\text{Age Set}}$ x $\mathbb{I}^{\text{Young}}$	Yes	Yes	Yes
Ethnicity-Level Controls	No	Yes	Yes
Household Asset Controls	No	No	Yes

Notes: The unit of observation is a child. $\mathbb{I}^{\text{Young}}$ is an indicator that equals one if the child is less than 24 months old. The dependent variable for each specification is listed at the top of each panel and the included controls are listed at the bottom of each column. Standard errors are clustered at the district level.

Table A18: Factor Loadings from Principal Component Analysis

Variable	Loading of First Principal Component
Weight-for-Height (percentile)	0.3017
Weight-for-Age (percentile)	0.4233
Height-for-Age (percentile)	0.3124
Weight-for-Height (z-score)	0.3015
Weight-for-Age (z-score)	0.4469
Height-for-Age (z-score)	0.338
Weight-for-Height (Bottom 5% Indicator)	-0.1559
Weight-for-Age (Bottom 5% Indicator)	-0.3453
Height-for-Age (Bottom 5% Indicator)	-0.2895

Notes: This table presents the loading weights of the first principal component of the nine characteristics listed in the left column. The sample includes all children under the age of 5 in the 2016 round of Uganda's DHS. This principal component is used as the dependent variable in column 10 of Table A16.

Table A19: Effects of Pension Program on Primary Education in Societies With and Without Age Sets

Dependent Variable is an Indicator that Equals One if the Child is Currently Attending School					
	(1)	(2)	(3)	(4)	(5)
		Full Sample		Male	Female
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Kin}}$	0.0104	0.0102	0.00661	0.0108	-0.00500
	(0.00472)	(0.00449)	(0.00444)	(0.00415)	(0.00679)
Potential Exposure * $\mathbb{I}^{\text{Pilot}}$* $\mathbb{I}^{\text{Age Set}}$	0.000619	-0.00317	-0.00347	-0.0190	0.00679
	(0.0124)	(0.0164)	(0.0160)	(0.0125)	(0.0194)
Observations	18,384	18,383	18,383	9,016	9,223
R-squared	0.190	0.191	0.232	0.212	0.271
District x Ethnicity FE	Yes	Yes	Yes	Yes	Yes
Interview Month FE	Yes	Yes	Yes	Yes	Yes
Age Set x Potential Exposure FE	No	Yes	Yes	Yes	Yes
Age x Gender FE	No	No	Yes	Yes	Yes
p-value, $\beta_1 = \beta_2$	0.464	0.435	0.544	0.026	0.566
Mean Non-Pilot	0.927	0.927	0.927	0.927	0.927

Note: The unit of observation is a child between the ages of 6 and 14 years old. The dependent variable is an indicator variable that takes value one if the child is currently in school. Potential exposure is a measure of exposure to the pension constructed as indicated in Equation 6. $\mathbb{I}^{\text{Treat}}$ is an indicator variable that takes value one if the household is in a pilot district, and 0 otherwise. $\mathbb{I}^{\text{Age Set}}$ is an indicator variable that takes value one if the household belongs to an age set society and 0 otherwise. $\mathbb{I}^{\text{Kin}}$ is an indicator variable that takes value one if the household belongs to a kin-based society and 0 otherwise. Standard errors are clustered at the district level.

Table A20: Effects of Pension Program on Secondary Education and Marriage in Societies With and Without Age Sets

	Males		Females	
	(1)	(2)	(3)	(4)
	In school	Married	In school	Married
Potential Exposure * $\mathbb{I}^{\text{Pilot}*}$ $\mathbb{I}^{\text{Kin}}$	0.0416	-0.000606	-0.0558	0.0381
	(0.0242)	(0.00138)	(0.0213)	(0.0126)
Potential Exposure * $\mathbb{I}^{\text{Pilot}*}$ $\mathbb{I}^{\text{Age Set}}$	0.0130	-0.00327	0.00344	0.00313
	(0.0302)	(0.00343)	(0.0186)	(0.00886)
Observations	1,740	1,740	2,245	2,245
R-squared	0.205	0.110	0.244	0.190
District x Ethnicity FE	Yes	Yes	Yes	Yes
Interview Month FE	Yes	Yes	Yes	Yes
Age Set x Potential Exposure FE	Yes	Yes	Yes	Yes
Age x Gender FE	Yes	Yes	Yes	Yes
p-value, $\beta_1 = \beta_2$	0.477	0.475	0.038	0.025
Mean Non-Pilot	0.716	0.040	0.716	0.040

Note: The unit of observation is a child between the ages of 15 and 18 years old. The dependent variables are indicator variables that take the value one if the child is in secondary school (columns 1 and 3) or if the child is married (columns 2 and 4). The sample includes all male children in columns 1-2 and all female children in columns 3-4. Potential exposure is a measure of exposure to the pension constructed as indicated in Equation 6. $\mathbb{I}^{\text{Treat}}$ is a indicator variable that takes value one if the household is in a pilot district, and 0 otherwise. $\mathbb{I}^{\text{Age Set}}$ is an indicator variable that takes value one if the household belongs to an age set society and 0 otherwise. $\mathbb{I}^{\text{Kin}}$ is an indicator variable that takes value one if the household belongs to a kin-based society and 0 otherwise. Standard errors are clustered at the district level.

Table A21: Life Cycle Consumption in Societies With and Without Age Sets

	(1) Full Sample	(2) Males Only	(3) Full Sample	(4) Males Only
	Main Providers		Main providers who are household heads	
Age*$\mathbb{I}^{\text{Age Set}}$	0.00534	0.00636	0.00925	0.0127
	(0.00372)	(0.00451)	(0.00447)	(0.00468)
Age*$\mathbb{I}^{\text{Kin}}$	-0.0121	-0.0131	-0.0144	-0.0135
	(0.00396)	(0.00428)	(0.00497)	(0.00508)
Age^2*$\mathbb{I}^{\text{Age Set}}$	-7.32e-05	-7.09e-05	-0.000119	-0.000139
	(4.07e-05)	(4.87e-05)	(4.75e-05)	(4.90e-05)
Age^2*$\mathbb{I}^{\text{Kin}}$	9.95e-05	0.000118	0.000118	0.000119
	(4.16e-05)	(4.11e-05)	(5.04e-05)	(4.80e-05)
Observations	5,063	3,812	4,224	3,326
R-squared	0.519	0.509	0.517	0.502
Sub-Location x Ethnicity FE	Yes	Yes	Yes	Yes
Controlling for hh size	Yes	Yes	Yes	Yes
P-value equality linear Term	0.00215	0.00326	0.000708	0.000442
P-value equality quadratic term	0.00481	0.00531	0.00127	0.000528

Notes: The unit of observation is a main provider in the HSNP baseline data. In columns 3-4, we further restrict the sample to include only main providers who are also household heads. $\mathbb{I}^{\text{Age Set}}$ is an indicator variable that takes value one if the household belongs to an age set society and 0 otherwise. $\mathbb{I}^{\text{Kin}}$ is an indicator variable that takes value one if the household belongs to a kin-based society and 0 otherwise. All columns control for the number of household members. Standard errors clustered at the sub-location level.