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Developmental Assets and Sexual and Reproductive Health among 10 to14 Year Olds in Uganda

STUDY REPORT

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STUDY SUMMARY

With support from USAID, Georgetown University's Institute for Reproductive Health (IRH) and Search Institute collaborated to conduct a study of very young adolescents (ages 10 to14) in a developing country setting (north central Uganda), examining the link between internal and external assets the youth may experience, and their sexual and reproductive health. Specifically, we investigated whether positive relationships, opportunities, values, skills, and self-perceptions (developmental assets) as measured by Search Institute's *Development Assets Profile* (DAP) survey, are significantly associated with indicators of sexual and reproductive health (SRH), including measures such as SRH knowledge, ability to access SRH services, and availability of adult and peer resources for discussing SRH matters. We also looked at differences between boys and girls in both the prevalence of SRH indicators and the association between developmental assets and those SRH measures. This report describes the rationale for the study, our research questions, how the study was conducted, and the study results.

Procedure

An initial survey and study design were approved by Georgetown University's IRB in January 2014, with the final survey and design receiving IRB approval in April 2014. IRH staff in north central Uganda recruited youth for both the pilot and final sample from local primary and secondary schools. Parental consent and child assent was obtained for all participating youth using IRB-approved consent and assent forms. The DAP survey and SRH questions were translated into the Luo language, and a process of back-translation, re-translation, and subsequent back-translation continued until Ugandan IRH staff, U.S. IRH staff, and Search Institute staff achieved consensus that the translation had captured the essence of the items.

Sample

A sample of 128 youth ages 10 to14 completed the DAP surveys in an initial pilot test during March and April 2014. Schools similar to, but not included in, the study were selected for the pilot. A total of 941 youth in that age range completed the final survey in June 2014. For primary data collection, primary and secondary schools were randomly selected from a list of schools in Gulu district. In each school, age eligible students were systematically selected from enrollment lists.

Key Findings

Reliability and Validity of DAP Measures

- The internal consistency reliabilities[1] of the total DAP and most of the DAP subscales are either at acceptable or promising levels. Reliability for the Constructive Use of Time asset category scale is unacceptable, and for the Empowerment, scale, barely "promising."
- The distribution of DAP responses has a moderately higher proportion in the high or positive end. However, there also is reasonable response variation across asset category and context subscales. This suggests the validity of the DAP responses.

Substantive Findings: Developmental Assets and SRH Outcomes

- Of nine key SRH outcomes, young adolescents in this sample did not meet criterion levels for "having" three of them (accurate knowledge about pregnancy risk, supportive relationships for girls, and supportive relationships for boys), and only had small to moderate majorities (57%-65%) meeting criterion levels for five other outcomes (equitable gender attitudes, accurate knowledge about puberty, ability to access SRH services, condom exposure and knowledge, and intention to delay sex and use a condom at first sex (for simplicity, subsequently called "intended sexual behavior").

[1] See Appendix for definitions of reliability, validity, and response distribution.

- Girls are more likely than boys to have most of the SRH outcomes: Supportive relationships where they can talk with someone about pubertal changes; accurate knowledge about puberty; accurate knowledge about pregnancy risk; equitable gender attitudes; the ability to access SRH services; accurate knowledge about HIV risk, and intended sexual behavior. Boys are slightly more likely than girls to have accurate knowledge of and exposure to condoms.
- Youth with higher levels of developmental assets had more accurate knowledge about puberty, more accurate knowledge about HIV risk, more ability to access SRH services, more supportive relationships in which they could talk about feelings and what happens during puberty, and lower intentions to engage in risky sexual behavior.
- In addition, on SRH indicators measured by single items, the higher the girls' assets, the less likely they were to agree that girls should be flattered when boys tease them and the more likely they were to say they could tell a boy to stop doing something that made the girl uncomfortable.
- Analyses of differences in these SRH outcome means by asset levels were also conducted, showing that youth with asset scores in the highest of four possible asset levels ("Thriving" youth) were better than all other youth on three outcomes (accurate knowledge of puberty, accurate knowledge of HIV risk, and for boys, supportive relationships). These Thriving youth, along with youth at the second-highest level of assets ("Adequate"), also more frequently than youth at the lowest and second-lowest asset levels ("Challenged," and "Vulnerable") reported intention to delay sex and use a condom at first sex (intended sexual behavior). Youth at the Challenged level of assets, the lowest assets level, were worse than all other youth on ability to access SRH services.
- Odds ratios showed that these SRH differences by asset level were meaningful in terms of size: Adolescents who had at least Adequate levels of developmental assets were 71% more likely to have accurate HIV knowledge, 34% more likely to believe they could access SRH services, and 98% more likely to intend to delay sex until marriage or use a condom, than were youth at the Challenged or Vulnerable asset levels. Youth at the highest asset level, Thriving, were also 57% more likely to have accurate condom knowledge and 78% (girls) and 102% (boys) more likely to have supportive relationships, than all other youth. The size of these differences based on developmental assets level can translate into consequential differences in the sexual and reproductive health of these very young adolescents.

RATIONALE FOR THE STUDY

Particularly in lower and middle income countries, research on adolescent sexual and reproductive health needs to further clarify the broader developmental paths of adolescents in various settings. Previous research on adolescents tends to focus narrowly on standard demographic sexual and reproductive health (SRH) data, failing to capture the wider context of adolescent's lives. Identifying the social factors and assets that predispose adolescents to risky behavior or protects them is a priority so that programs can focus on addressing these factors, thereby broadening potentially valid intervention targets and increasing their effectiveness as a result. The current study does this in its emphasis on better understanding the personal and social strengths and assets young people in northern Uganda experience, and how these are related to sexual and reproductive health variables. In addition, experts agree that early adolescence (10 to14 years) is a critical transition period in young people's lives when exposure to risk-taking behavior often increases and when prevention can be especially effective, and yet is overlooked by many adolescent health programs (WHO, 2010). Systematically-collected information on this age group that could guide programs is scant. The information that exists often is limited to adolescent knowledge related to pregnancy and STI/HIV prevention. There is little research that explores very young adolescents' knowledge and awareness of their physical changes during puberty, their rights or responsibilities, and even less on their resilience, self-efficacy, and other developmental assets, or the relationship of those assets with young people's sexual and reproductive health. The current study provides this focus on very young adolescents, and examines the relationship between personal and social assets and sexual and reproductive health in that vulnerable age group in one low-income country. Finally, the current study brings more attention to how young people feel

about themselves, their lives, and their ecological contexts. This emphasis on the perspective of the young person may also help in developing more effective youth health programming and interventions.

Developmental Assets are the relationships, opportunities, values, skills, and self-perceptions that research shows are strongly related to children's and youths' well-being (Benson, 2006; Benson, Leffert, Scales, & Blyth, 1998; Benson, Scales, Hamilton, & Sesma, 2006; Benson, Scales, & Syvertsen, 2011; Leffert, Benson, Scales, Sharma, Drake, & Blyth, 1998; Scales, Benson, Leffert, & Blyth, 2000; Scales & Leffert, 2004; Scales, Sesma, & Bolstrom, 2004). Eight broad categories of assets are divided into external assets, supports, experiences, and opportunities, provided by people in the young person's family, community, school, or peer network; and internal assets, beliefs, attitudes, and behaviors within a young person. (See Figure 1.) In addition, external and internal assets can be understood in terms of the ecological contexts in which they built or developed. (See Figure 2.) The Developmental Assets Profile (DAP) survey used in the current study is a 58-item survey in which youth report how much they experience the four categories of external assets and four categories of internal assets shown in Figure 1, and the five contexts shown in Figure 2 (see more detail on the DAP below). The assets' conceptualization of youth development in terms of external contexts and supports paired with a focus on internal youth strengths allows for a holistic understanding of child and youth well-being.

Developmental assets have been linked to a variety of positive outcomes. These include:

- better school grades (Scales & Benson, 2007; Starkman, Scales, & Roberts, 2006; Scales, Benson, Roehlkepartain, Sesma, & van Dulmen, 2006);
- higher levels of purpose (Scales, Benson, Moore, Lippman, Brown, & Zaff, 2008; Scales, Benson, & Roehlkepartain, 2011);
- positive emotions (Scales, Benson,& Roehlkepartain, 2011);
- citizenship/civic engagement (Scales et al., 2008; Scales, Benson, & Roehlkepartain, 2011; Scales & Roehlkepartain, 2004); and
- avoiding violence (Benson & Scales, 2009; Benson, Scales, Leffert, & Roehlkepartain, 1999).

Previous research with U.S. samples of adolescents ages 12-18 has yielded two key findings relevant to the proposed research. First, the more assets youth experience, the less likely young people are to engage in sexual intercourse, or to do so without

Figure 1. THE EIGHT CATEGORIES OF DEVELOPMENTAL ASSETS MEASURED IN THE DAP

External Assets

SUPPORT

Young people need to be surrounded by people who love, care for, appreciate, and accept them.

EMPOWERMENT

Young people need to feel valued and valuable. This happens when youth feel safe and respected.

BOUDARIES AND EXPECTATIONS

Young people need clear rules, consistent consequences for breaking rules, and encouragement to do their best.

CONSTRUCTIVE USE OF TIME

Young people need opportunities — outside of school—to learn and develop new skills and interests with other youth and adults.

Internal Assets

COMMITMENT TO LEARNING

Young people need a sense of the lasting importance of learning and a belief in their own abilities.

POSITIVE VALUES

Young people need to develop strong guiding values or principles to help them make healthy life choices, including responsibility, empathy, and self-control.

SOCIAL COMPETENCIES

Young people need the skills to interact effectively with others, to make difficult decisions, and to cope with new situations.

POSITIVE IDENTITY

Young people need to believe in their own self-worth and to feel that they have control over the things that happen to them.

using contraception (Benson, Scales, Roehlkepartain, & Leffert, 2011). Second, specific assets help promote positive adolescent health outcomes. For example, three assets—restraint, positive peer influence, and time at home—explain 19% of adolescent sexual intercourse (Leffert, Benson, Scales, Sharma, Drake, & Blyth, 1998). In addition, the overwhelming weight of the research evidence suggests that many of the constructs included in the Developmental Assets framework likely contribute to lowered risk of problem sexual behavior. These assets include family support, contributing service to others, positive peer influences, achievement motivation, connection to youth programs and religious community, values such as restraint, and competencies such as planning and decision making as well as resistance skills (as reviewed in Scales & Leffert, 2004).

Figure 2. THE FIVE ASSET-BUILDING CONTEXTS MEASURED IN THE DAP

Context	Description
Personal assets	Internal strengths that shape the character of young people, including their self-concept, values, attitudes, and capabilities.
Social assets	Social assets are experienced through personal relationships with others, particularly their friends.
Family assets	Assets experienced in the family.
School assets	Assets experienced in school.
Community assets	Assets experienced in community settings other than school.

There is greater knowledge in recent years of effective ways of positively affecting adolescent health outcomes, in both developed and developing countries. One well-done review of 83 curriculum-based studies meeting criteria for using quasi-experimental or experimental designs, for example, included 18 studies from developing countries (including Kenya, Namibia, South Africa, Tanzania, and Zambia). This study found that two-thirds of the programs had strong effects on preventing high-risk sexual behavior or promoting HIV and pregnancy prevention among youth (Kirby, Laris, & Rolleri, 2007). However, these linkages of developmental assets and health outcomes have not been well-explored in non U.S. samples. For example, a Save the Children youth empowerment program for young rural girls in Bangladesh was found to increase developmental assets by an average of 22% across two years of program cohorts (Scales et al., 2013). However, the program did not include other outcome measures to link with the change in assets. Assets and knowledge of STI/HIV prevention were studied among youth and young adults in four conflict or post-conflict countries (including Rwanda) in a recent USAID-funded study (Scales, Roehlkepartain, & Fraher, 2012). However, the findings were insignificant, likely because the HIV knowledge measure had to be too brief to be of good quality.

The current research examined the link between developmental assets and adolescent health in a developing country. As such, it may have important implications for expanding options in both positive youth development and public health programs that can promote health among young people worldwide. The research utilized measures of knowledge of puberty and fertility, HIV knowledge and gender linked outcomes, as well as high-quality developmental assets measures, with a large enough sample of young adolescents to detect the moderate level of adolescent health-assets associations found in U.S. samples. Thus, the research contributes to addressing a critical knowledge gap by providing high-quality information. The study helps: 1) identify assets that can be used to evaluate adolescent health programs, 2) provide program and policy implications for improving the well-being of young people, and 3) provide evidence justifying investment of international adolescent health funding in building developmental assets as a strategy for promoting adolescent well-being.

PROCEDURES

The study used a one-group design to measure the relation of developmental assets to adolescent health. The study consisted of a one-time administration of a 30-45 minute survey. The survey contained questions on developmental assets and adolescent health attitudes and behaviors, and was given to adolescents, girls and boys, aged 10 to14 years in Gulu district in north central Uganda. The region was

selected because of the ongoing activities of the research team and in-country partners in this geographic area. Approval was also received from the office of the District Education Officer (DEO), Municipal Education Officer (MEO), and the government's local IRB. A smaller pilot study of 128 youth in that age group was undertaken to ensure the survey questions could be understood and to validate the instrument in this population. We also pilot tested the survey administration procedures.

Field work began with a focus on adaptation of the DAP instrument to the local Ugandan context, and translation into the local language, Luo. The research team was led by the IRH Principal Investigator (PI) in collaboration with the IRH Co-PI based in Uganda and the Search Institute Co-PI (based in Minneapolis, Minnesota). IRH hired 24 (12 male and 12 female) interviewers to conduct surveys and data entry for the study. These interviewers were from northern Uganda. They were fluent in English and Luo, and had intimate and extensive knowledge of the social, cultural, and political context in the region. The interviewers had particular expertise in working with very young adolescents (ages 10-14), as well as training in social work, counseling, and/or psychology. All interviewers had conducted data collection on IRH's ongoing Gender Roles, Equality, and Transformation (GREAT) project among youth of the same age and across similar topic areas. Although these interviewers were known to IRH, collaborating partners who had previously worked with the interviewers were asked to provide a reference for each interviewer. Only after this external reference check was completed did interviewers initiate study activities. Furthermore, all interviewers received training in research ethics, protecting human subjects and child protection, as well as study objectives, data collection instrument and administration procedures, by trained research staff (Co-PIs above).

To adapt the instrument to the local context, and translate the instrument from English into Luo, Search Institute researchers worked with the IRH's GREAT Program Manager and Research, Monitoring and Evaluation (MLE) Coordinator and interviewers. Search Institute provided orientation and training via webinar to local collaborators so they could understand the underlying asset-based approach and framework for positive youth development. The team then adapted the instrument through a collaborative approach. The team worked with bilingual interviewers (English and Luo) to translate the DAP survey. A bilingual Luo language expert in Uganda who did not participate in the original English to Luo translation prepared a back translation and provided this to the research team. The research team reviewed the back translation to determine if it had retained the intent of the original English items, while being culturally valid in the Ugandan context.

In the pilot study, we tested two alternative administration procedures. The DAP was designed to be self-administered by youth. It also has been successfully administered internationally in both fully oral and facilitator-assisted self-administrations modes. Literacy levels were relatively low in this sample, so it was important to test alternative administration methods. Thus, youth in lower grade levels in the pilot sample were assigned to a one-on-one facilitator-assisted oral survey administration. Youth in higher grade levels (secondary school) were assigned to oral group administration, with one or two data collectors reading the entire survey aloud while a small group of youth with sufficient functional literacy followed along with the item numbers listed and marked their own responses. Participants in the survey were selected from primary and secondary schools in Gulu district that already have a working relationship with the GREAT Program. All survey administration took place at the participating schools in a public space where auditory and visual privacy was ensured. Interviewers were experienced in obtaining privacy during interviews and knew not to conduct interviews if privacy could not be ensured. The pilot was also used to assess the need for female interviewers to interview females and male interviewers to interview males, given the content of the survey.

Results helped determine the administration method to be used subsequently with the large primary sample. In the pilot, we found that the individual method yielded higher reliability in four DAP scales, and the group method yielded higher reliability on a different set of four scales. For the total DAP score level, which is the primary variable used in assessing the link of developmental assets with SRH outcomes, there was no difference in reliability based on the differing survey administration methods. Because neither method appeared inherently better than the other in terms of the internal consistency

reliability of the scales for the pilot sample, we chose to use the individual method for the subsequent full study, to maximize privacy and confidentiality.

Additionally, the pilot test administration allowed the research team the opportunity to assess the measures themselves. While for the most part the pilot test helped the team to revise existing items, in one case, a set of items were replaced by new ones. A skip pattern lead to six items focused on sexual behavior (including having had sexual intercourse), and these were answered only by a handful of youth, with only two of the 128 pilot test participants reporting that they had had sexual intercourse, or had participated in other sexual behavior. The lack of responses to the section as a whole, paired with only two youth reporting sexual intercourse, suggested that the measure would not yield a large enough subgroup to be feasible for analysis; it also suggested that the items themselves may not be appropriate to the very young adolescent age group. As a result, the section was replaced with five items assessing *intention* to delay sex and use a condom when engaging in intercourse.

The research team analyzed results (including survey administration notes from interviewers) to determine how well youth understood the items, and how well the items performed statistically. This included looking at the range of responses, response variability, internal consistency, and validity of DAP scales, and any gender or age differences in responses. The DAP Uganda instrument and survey administration methods were then revised based on results of the pilot. Final versions of all tools, in English and in Luo, were provided to the IRB before final study implementation.

Sample Recruitment

IRH's GREAT program manager requested a list of primary and secondary schools from the Gulu district education officials. This was the sampling frame for selection of schools and students for inclusion in the survey. From this list, schools were stratified by type of school, primary and secondary, and rural and semi-urban location. Within each stratum, schools were randomly selected to obtain a sample representative of the student population. Within each selected school, individual classrooms were systematically selected. All students in the selected classrooms who met eligibility criteria were selected until the desired sample size of 1,000 students was achieved. Once the schools were selected, interviewers contacted the school principals to explain the purpose of the study and to request permission to recruit students from the school to participate. Then, in collaboration with school administration and teachers, informational events for parents were organized, and all parents of students in selected classrooms were invited. The parent events provided oral and written explanation of the study, its purpose, risks, and benefits. After participation in the event, parents were asked to indicate via consent form if they gave consent for their child to participate or not. Only students whose parents gave consent for their participation were asked to meet with interviewers on the day of data collection. At that time, these students were then asked if they assented to participation, after receiving a similar explanation of the study, its purpose, risks, and benefits. Students were asked to indicate if they wished to participate or not. Only after receiving informed assent from students and consent from parents did the interviewers administer the survey.[2] Interviewers worked closely with teachers, school administrators, and district education officials to implement the survey with the least amount of disruption to the regular classroom and school schedules. No youth declined participation, nor did any parents. However, a small number of parents (less than 10%) did not return signed consent forms by the deadline, and as a result those few youth did not participate.

[2] Due to the socioeconomic status of participants and their families, it is possible that parents/legal guardians may have had difficulty with a written consent process. All assent and consent forms and a description of the study were read out loud to the respective participant or parent/legal guardian. For illiterate and low literate parents/legal guardians a thumb print was used to sign the respective consent form. A literate witness ensured that all relevant information was read to the participant and their parents or legal guardian. A thumb print was used to indicate consent on the relevant informed consent form. A literate witness observed the consent process and signed the consent form. The literate witness was not affiliated with the study. He or she might have been a friend, relative, teacher, religious leader, or other community member. The witness was present only for the informed consent process, not for the interview itself.

Sample Characteristics

A total of 941 10 to14 year old girls and boys were administered the Luo DAP and sexual and reproductive health items. No surveys were lost due to data cleaning. The young adolescents came from 14 primary and secondary schools in northern Uganda. The final sample included 12% age 10, 15% age 11, 20% age 12, 29% age 13, and 24% age 14. By grades, 84% were in primary school, and 16% in secondary. The sample was comprised of 52% females and 48% males. In addition, a majority of youth reported their religion as Catholic (69%), and the great majority of youth reported their tribe as Acholi (90%) (Table 1).

Additional demographic variables included the relationship of adults who live with the young person. Half of the youth (50%) reported living with both their mother and father, with 27% living with mother only and 7% with father only. However, youth were directed to mark all responses that apply, and many did mark multiple responses. Thus, 22% also reported living with a grandparent, 29% with an adult brother or sister, and 28% with other relatives. It should also be noted that only 1 youth (0%) reported living without any adults.

Youth were also asked to report the main occupation of their primary caregiver. Forty-eight percent listed mother as the primary caregiver, 30% father, 9% grandparents, 3% adult siblings, and 10% other relatives. Occupationally, the largest employment of primary caregivers was in farming (46%), followed by informal employment such as odd jobs (25%), and formal employment (including teachers, government workers, and police officers, 20%). Among the youth themselves, 36% reported not working, but 37% reported farming work, 11% selling food, 10% brick laying or casual labor, and 6% other.

Table 1. *Number and Percentage of Northern Uganda Young Adolescents by Demographic Variable*

	# Youth	Valid %
Age		
10	114	12
11	142	15
12	185	20
13	277	29
14	223	24
Gender		
Female	487	52
Male	454	48
Religion		
Catholic	648	69
Muslim	20	2
Pentecostal	153	16
Protestant	116	12
Other	1	0
SDA	2	0
Tribe		
Acholi	841	90
Ateso	4	0
Lango	19	2
Mukene	60	6
Ma'di	14	2

Finally, a substantial majority of the children's families were struggling financially. More than a third of these 10 to14 year old youth (36%) reported that their family had difficulty affording basic things, and 40% said they could get just basic necessities. About 20% said their families could sometimes afford special things, on top of necessities, and just 3% said they could buy whatever they wished.

Measures

In this study, the measure of developmental assets was Search Institute's *Developmental Assets Profile* (DAP) survey. The DAP is a 58-item survey in which youth report how much they experience four categories of external assets and four categories of internal assets. In addition, "context scales" such as family and school context are reported. The context scales are simply the same 58 DAP items as make up the asset category scales, but re-grouped to reflect the various contexts of a young person's life, such as family, school, and community (defined in Figure 1). The survey was originally designed for young people ages 11to18 years. It has been administered to more than 500,000 youth and young adults in the United States and internationally since its development in 2004. All DAP items are answered

on the following scale: Not At All or Rarely (0 points), Somewhat or Sometimes (1 point), Very or Often (2 points), Extremely or Almost Always (3 points). Each scale can thus have a mean ranging from 0-3, and scale scores from 0-30 are obtained by then multiplying the mean score by 10. The Total DAP score ranges from 0-60 and is derived by adding the Internal assets score (0-30) to the External assets score (0-30). The DAP has been shown to be a high quality survey based on the consistency of youth responses (reliability) and the relation of the asset scores to youth well-being (validity). These have been found among both American youth (Search Institute, 2005), and among samples of youth from more than a dozen other countries (Scales, 2011; Scales, Benson, Dershem, Fraher, Makkonen, Nazneen, Syvertsen, & Titus, 2012; Scales, Roehlkepartain, & Fraher, 2012).

The DAP is widely and increasingly used in international research, and the scales have shown good quality cross-culturally. Across 33 administrations in 25 countries involving more than 23,000 youth and young adults ages 9-31, mostly ages 11-19 (in Albania, Armenia, Bangladesh, Cambodia, China, Ethiopia, Georgia, Honduras, Iraq, Japan, Jordan, Kazakhstan, Laos, Lebanon, Mexico, Mongolia, Nepal, the Philippines, Rwanda, Sri Lanka, Tanzania, Uganda, Vietnam, Yemen), 67% of the alpha reliabilities for the assets category, context, Internal and External sub-scales, and the total DAP have been ≥ .70 (388 of 576 total alphas), 20% have been .60-.69 (116/576), and just 13% have been < .60 (73/576), with more than half of those unacceptable alphas being in one sub-scale, Constructive Use of Time, a sub-scale that intentionally is multi-dimensional, and so, by its intent, structurally encourages a lower alpha. Scores on the DAP have also been linked to positive youth outcomes in international samples (Scales, 2011; Scales, Roehlkepartaion, & Fraher, 2012). In a US-funded study, for example, approximately 900 youth in each of Bangladesh, Honduras, Jordan, and Rwanda were surveyed in the local languages. DAP scores were correlated with youth education, health, workforce and livelihoods development, conflict mitigation, and civic engagement outcomes. The total DAP score was significantly correlated with every outcome in every country (Scales, Roehlkepartain, & Fraher, 2012).

Measures of adolescent and reproductive health included constructs such as knowledge of puberty, pregnancy risk, HIV, communication with parents and other trusted adults, peers and siblings about puberty and physical changes during adolescence, HIV and other sexually transmitted infections, health care access and puberty-related gender norms. Measures were drawn from 1) previous IRH measures used in the GREAT Program baseline study of adolescents, 2) previous Search Institute measures developed for a USAID-funded study of developmental assets among youth and young adults in Bangladesh, Honduras, Jordan, and Rwanda (Scales, Roehlkepartain, & Fraher, 2012), and 3) measures created for this study. Most of the SRH measures were either single-items or were intended to be indexes rather than uni-dimensional scales; thus, internal consistency reliability is not a meaningful indication of their quality (Scales et al., 2008).

RESULTS

We first discuss results covering the psychometric properties of the survey among this sample, including internal consistency reliabilities and response variability (descriptive statistics for the levels of developmental assets experienced by the sample). We then present descriptive statistics for the sexual and reproductive health measures (SRH), and correlations between levels of developmental assets and SRH outcomes (shedding light both on the concurrent validity of the DAP for this sample of 10 to14 year old Ugandan young adolescents, and on the potential utility of promoting developmental assets as a means of strengthening sexual and reproductive health among this age group in Uganda).

A. DAP Internal Consistency Reliability

The first set of analyses focuses on the internal consistency reliability of the DAP portion of the survey for this sample. Here, we measure the reliability of the scales; the scales are the grouping of items measuring a particular domain (such as asset categories or context views). The alpha reliabilities of each scale indicate the degree to which items or questions within a scale are internally consistent, that

is, seem to be measuring the same thing. An alpha reliability coefficient of .70 or higher is widely considered to be acceptable.[3]

Table 2 shows the alpha coefficients that reflect the internal consistency reliability of the total DAP and the various DAP subscales. All but one of the scales showed an increase in alpha reliability over the pilot study results with a much smaller sample, and the one scale that did not increase, Empowerment, stayed exactly the same.

Table 2. *Alpha reliabilities of DAP scales*

	N=941
Total DAP Scale	.94
External	.88
Internal	.91
Asset Categories	
Support	.70
Empowerment	.62
Boundaries & Expectations	.76
Constructive Use of Time	.57
Commitment to Learning	.72
Positive Values	.78
Social Competencies	.73
Positive Identity	.67
Context View	
Personal	.78
Social	.83
Family	.76
School	.77
Community	.82

*Red indicates unacceptable alpha coefficients, or <60

These results show that one of the asset category scales has unacceptable reliability, Constructive Use of Time, and another, Empowerment, is barely promising.

- The Constructive Use of Time subscale is intentionally multi-dimensional, that is, it measures several different sub-constructs, not just one construct. In this case, it measures use of time across family, school, and out of school settings, rather than use of time within one setting. Measuring multiple dimensions of a construct within one scale by definition works against its having a high internal consistency, and low alphas for this subscale are common even in the U.S. where the DAP was originally developed.
- The barely "promising" alpha for Empowerment is more concerning. The Empowerment asset category is about the degree to which the young person feels valued, respected, and safe. Although we attempted to make the translation of the items more appropriate for use with these young adolescents, the Empowerment internal consistency stayed the same as in the pilot study. Findings for that scale, therefore, should be interpreted with caution.[4]

Note that the five "context" scales have higher alphas, that is, the responses to items making up these scales are more internally consistent. These better alphas are no doubt due to the same 58 items being grouped in five context subscales instead of eight asset category scales, due to the mathematical fact that increasing the number of items in a scale typically increases its alpha.

[3] Alpha coefficients below .60 are, likewise, commonly considered poor or unacceptable, while the area between .60-.69 is considered one of questionable reliability (Cortina, 1993; George & Mallery, 2003). Thus, alphas between .60-.69 may be interpreted as needing improvement, while showing some promise of higher internal consistency if improvements based on item analysis or factor analysis are made. Interpretation of alpha is always subject to context. In the current context, adaptations of a U.S. English instrument designed for use among 12 to18 year olds were made for a sample of Ugandan 10 to14 year olds in the Luo language. Under those circumstances, some degradation of the U.S. reliability coefficients (all in the acceptable to excellent range) would be expected. Placed in this context, then, the coefficients obtained here should be interpreted quite positively.

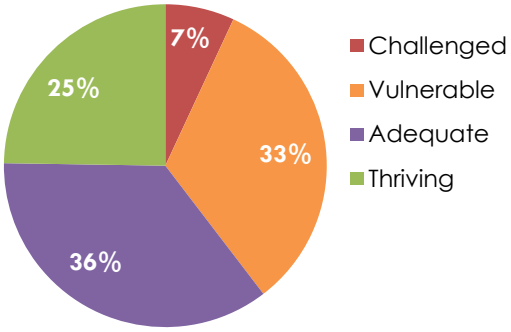
[4] Alpha is an indication that the measurement of these Empowerment items, as a group, is unacceptable. However, because the measurement of this and all other DAP scales in U.S. samples is consistently acceptable, the low alpha might be a contextual issue, that is, the translation might be fine but the concept is not culturally appropriate in some way to this Ugandan setting. It might not be appropriate, given contextual differences, to compare the U.S. results on the empowerment scale with northern Uganda. In the Ugandan context, the scale—that mixes questions about safety and security in a post conflict setting with feeling valued and respected—might not be measuring empowerment but something else. In other data from Northern Uganda, for example, very young adolescents in Uganda do feel very unsafe in their communities – youth often see their environment as dangerous and unsafe – quite possibly because of their post conflict setting. Thus, this result seems to resonate with other data from Uganda.

B. Response Distribution for the DAP Scales

The second set of analyses present participants' level of Developmental Assets. There are four ways that the DAP data are presented:

1. **Total Assets Score** for youth and the percentage of youth who fall into four levels based on their survey results: challenged; vulnerable; adequate; and thriving.
2. **Internal and external assets scores,** which show the levels of supports youth have in their families, schools, and communities (external assets) and their personal strengths and competencies (internal assets).
3. Levels of the **eight categories** of Developmental Assets (see below); and
4. Scores for each of the **five asset-building contexts** (see below).

Figure 3. *Percentage of Northern Uganda Young Adolescents (10-14 year olds), by Total DAP Score Quartile, n= 941*



We examined response distribution to determine if the DAP is able to distinguish between youth with higher and lower levels of developmental assets in their lives. Ideally, we would see roughly a bell-shaped distribution curve, with smaller numbers in the two extreme (highest and lowest) levels, and the majority of youth in the middle two levels.

Figure 2 shows that the distribution of responses has a higher proportion in the high or positive end of the DAP. That is, a majority of youth in this sample (61%) reported "adequate" or "thriving" levels of developmental assets. Table 4 shows the same results in a different way, by displaying the total DAP and sub-scale means, instead of the distribution across quartile levels. It shows that scores for only the Constructive Use of Time and Community sub-scales are in the Vulnerable level, with most scales in the Adequate level of developmental assets. At the high end of the distribution, the Commitment to Learning scale score is in the high end of Adequate, and the School context score is in the Thriving range. These scores suggest that these Ugandan youth have a basically acceptable level of developmental assets in their lives, especially in their families and schools, and in their positive attitudes about learning. Education is highly valued in Uganda, and so these results appear to accurately reflect Ugandan norms, thus further suggesting the validity of the results. The assets these youth experience in the community, however, could use significant improvement, as could their sense of being valued and safe (Empowerment), and the positive values and social skills they have.

Table 3. *Definition of DAP Score Quartiles, by Scale*

Quartile level scores for all DAP sub-scales are defined on a 0-30 scale. The total DAP score, however, is defined on a 0-60 scale. Table 3 shows each quartile score definition.

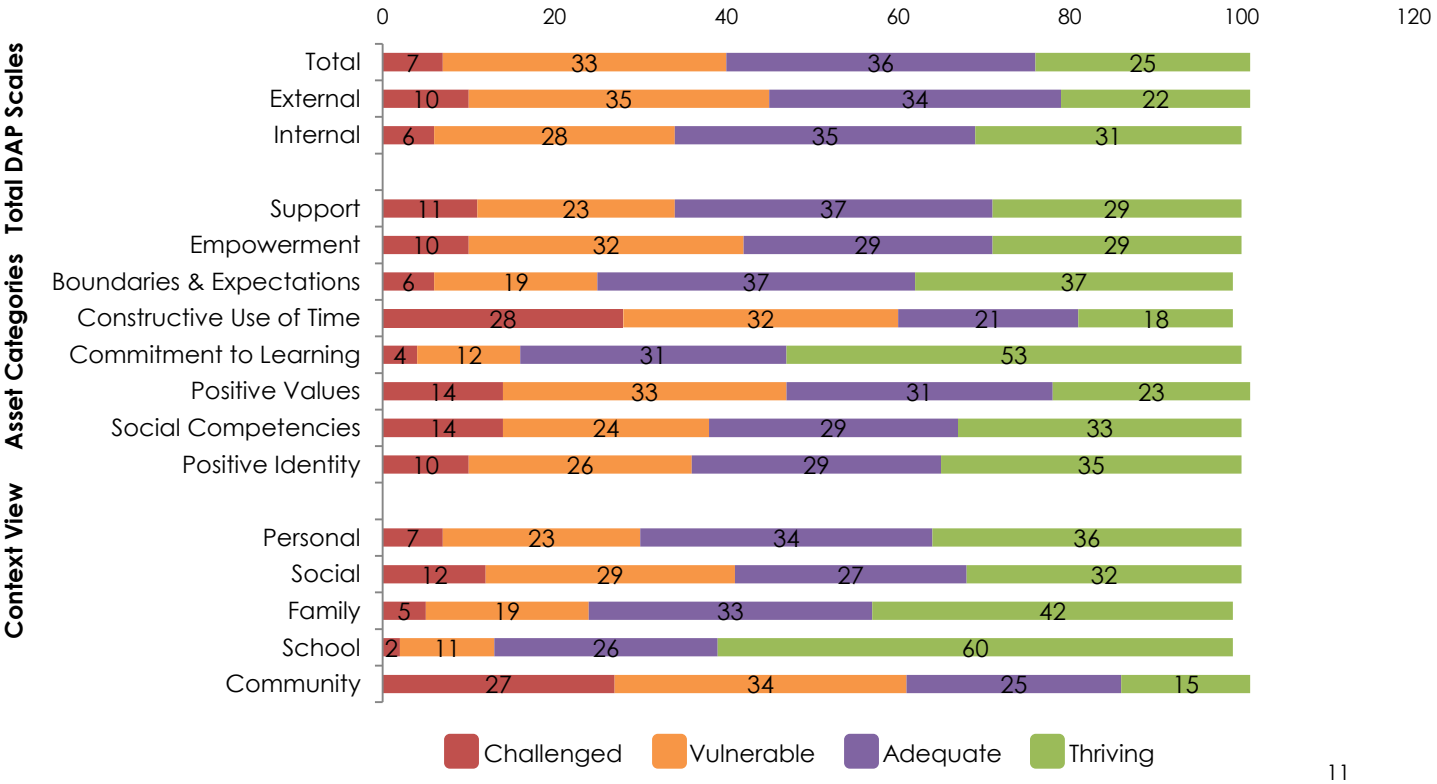
	Total DAP Scale (out of 60)	**DAP Asset Categories and Context View Scales** (Out of 30)
Challenged	0-29	0-15
Vulnerable	30-41	16-20
Adequate	42-51	21-25
Thriving	52-60	26-30

Table 4. *DAP Scale Means for Northern Uganda Young Adolescents, n=941*

Scale	Mean	Total Possible	Meaning
Total	44.43	60	Adequate
External	21.58	30	Low Adequate
Internal	22.85	30	Adequate
ASSET CATEGORY			
Support	22.59	30	Adequate
Empowerment	21.64	30	Low Adequate
Boundaries & Expectations	23.71	30	Adequate
Constructive Use of Time	18.38	30	Vulnerable
Commitment to Learning	25.49	30	High Adequate
Positive Values	21.32	30	Low Adequate
Social Competencies	21.95	30	Low Adequate
Positive Identity	22.65	30	Adequate
CONTEXT VIEW			
Personal	23.35	30	Adequate
Social	22.16	30	Low Adequate
Family	23.50	30	Adequate
School	25.65	30	Thriving
Community	18.99	30	Vulnerable

Despite the moderately high average score, Figure 4 also shows that there is reasonable response variation across asset category and context subscales, i.e., some scales have relatively higher percentages in the Thriving level and some scales have relatively lower. For example, Commitment to Learning has 53% in the Thriving level and just 4% in the Challenged level, but Positive Values and Constructive Use of Time have less than half that percentage in the Thriving level, and 3-7 times more youth in the Challenged level.

Figure 4. Percentage of Northern Uganda Young Adolescents (10-14 years) by DAP Score Quartile (n=941)



In general then, this pattern of results suggests that youth are making some distinctions as they respond to items, rather than responding with a consistently high, positive bias. There may be some level of socially desirable responses helping to inflate the results toward the positive end, but most of the responses are in the middle two of the four levels of assets, as would be expected.

In particular, in the area of Commitment to Learning, 53% of the sample was "thriving" (and for the School Context scale, 60%), a level rarely seen in any other DAP administration. These high positive scores could have resulted for different reasons:

- First, the youth could be responding honestly, and they actually do experience a high level of positive developmental influences in their environment, and a high level of internal strengths, particularly in their attitudes and dispositions about school and learning.
- Second, they could be responding in a socially desirable way, giving the response they feel is considered the best or socially acceptable response, regardless of whether it is actually true for them. Cultural traditions and customs often play a role in such a "positive bias." It should also be noted that youth were administered the survey during school. These factors may have promoted socially desirable responses, especially to the school-related items. If this is the case, it will be important in future research in Northern Uganda to consider ways to lessen social desirability bias in order to get at young people's true responses. However, as suggested earlier, education is highly regarded in Uganda, and so the positive results may not be biased at all, but simply an accurate reflection of these youths' cultural reality.

Overall, these results suggest that this sample is experiencing, on average, adequate levels of assets for well-being, since higher levels of assets consistently are shown in Search Institute studies to be linked to better academic, social-psychological, behavioral, health, civic, and workforce development outcomes.

C. Results: Descriptive Statistics for Sexual and Reproductive Health Outcomes

The focus of this research was on the relationship of developmental assets to sexual and reproductive health (SRH) among young adolescents. The SRH measures were among those previously used in IRH's GREAT project in Uganda, modified for this study.

In terms of pubertal development, this sample was in the early stages of puberty. Just 33% of girls said they had had their first period, and only 20% of boys had had a nocturnal emission or wet dream. A slight majority of the girls, 55%, said they could manage the issues around having their periods, but only 37% of boys who had had wet dreams said they understood what was happening. Nearly 1 in 5 girls who had had their period (19%) said they had missed 3 or more days of school as a result. Most of these youth did not talk with anyone about these experiences: 51% of girls said they had talked with someone in the last 3 months about how to take care of themselves during their periods, and just 18% of boys had talked with anyone in that time about how to take care of themselves after having their first nocturnal emission.[5]

Overall, 87% of the sample expects to be married one day. There were gender differences, reflected in the most desirable age for girls to get married, as compared to boys, with the "best age" for a girl to get married being younger than it was for boys: 18% said under age 20 was the best age for girls to marry, 22% said age 20, 30% said ages 21-29, and 31% said age 30 or older. For boys, the best marriage age was seen as older, with 14% saying under 20, 14% saying age 20, 31% between 21-29, and a substantial 41% saying age 30 or older was the best age for a boy to get married.

[5] For a similar item for boys only, asking if boys felt confident that they could explain what a wet dream is to a male sibling, 73% of reported that they could, even though only 34% of all boys who reported having had a wet dream said they understood what was happening during their first wet dream. Thus, this item was omitted here.

In terms of reporting on the frequency of the SRH indicators, binary scoring (a youth "has" or does not "have" the outcome) was used instead of continuous scoring (means) to report the prevalence of these indicators. Binary scoring was used for two reasons. First, the multi-item SRH measures were not intended to function as scales, but as indices. Means for groups of items that do not function adequately as scales (such as having unacceptable internal consistency reliability) do not have the same meaning as measures of central tendency, such as means derived from groups of items that do have adequate internal consistency and "hang together" as scales. Also, some of the SRH measures were single items only, whose means would not then be based on as much information as the means from multi-item measures. Second, differing response options were used for different measures, both multi-item and single item measures. Thus, means on the raw responses could not properly be compared with each other. Standardized means were used in some analyses, such as analyses of variance, to enable comparing results on measures with differing response options. But standardized means, by definition having a mean of 0 and a standard deviation of 1, cannot communicate the prevalence of an indicator in units that are meaningful for that indicator. For these reasons, binary scoring was used.

The cutoffs to determine whether youth "had" or did not have an indicator were based on scoring algorithms developed by Search Institute. The cutoffs are aspirational; that is, they are set to describe the level of indicator which we would hope all youth would achieve, in order to have adequate well-being. In general, these cutoffs require a response on any response scale that is equivalent to averaging an "agree" on a 4-point strongly agree to strongly disagree scale, across the items that make up that measure. Such a cutoff is neither unreasonably difficult for youth to attain, nor so easy to attain that the cutoff fails to discriminate between youth with higher or lower levels of well-being. The validity of this approach has long been demonstrated, as these cutoff levels have been shown to significantly differentiate levels of youth well-being on numerous academic, social-emotional, psychological, and behavioral outcomes, across wide diversities of youth samples (Benson, Scales, Roehlkepartain, & Leffert, 2011; Scales, Benson, Moore, Lippman, Brown, & Zaff, 2008).

Table 5 shows the percentage of the sample that met the criteria for having the SRH outcomes. Of eight key SRH outcomes[6], young adolescents in this sample did not meet criterion levels for "having" three of them (accurate knowledge about pregnancy risk, and supportive relationships for both girls and boys), and only had small to moderate majorities (57%-65%) meeting criterion levels for four other outcomes (equitable gender attitudes, accurate knowledge about puberty, ability to access SRH services, condom exposure and knowledge, and intended sexual behavior).

Table 5. *Percentage of Northern Uganda Young Adolescents with SRH Outcomes*[7]

	Criteria for outcome	**Valid %** (n=941)
Accurate knowledge about puberty	Correctly answers three of four knowledge questions	62
Accurate knowledge about pregnancy risk	Correctly answers three of four knowledge questions	47
Accurate knowledge of HIV risk	Answers false that HIV can be transmitted by mosquito bite	73
Condom exposure and knowledge	Answers true to condom can prevent pregnancy, and can prevent HIV	65
Ability to access SRH services	Answers four of five questions in the direction of agreeing they can access various SRH services	63

[6] IRH originally developed the SRH measures, not intending them to be scales, but either indexes, or treated as separate items. Thus, alpha reliabilities are inappropriate and not included here.
[7] A number of other outcomes all were deemed to be best considered as single items, and are discussed below.

Supportive relationships: Girls Only	Girls can talk with adults and friends, about changes in adolescence, feelings, and romantic relationships	24
Supportive relationships: Boys Only	Boys can talk with adults and friends, about changes in adolescence, feelings, and romantic relationships	12
Equitable Gender Attitudes	Answers five of six attitude questions in the direction of supporting equality between males and females	57
Intended sexual behavior	Expects to delay sex until marriage, and to use a condom if having sex before marriage	58

It is worth pointing out that 77% say they will use a condom if they do have sex before marriage. This figure can be interpreted both positively, and with some concern. On the one hand, 3 in 4 of these very young adolescents say they intend to take a major step toward HIV prevention, by using a condom. On the other hand, nearly 1 in 4 did not express this intention, which suggests there is still work to do to increase the intended use of condoms.

We conducted additional analyses of these outcomes by gender, shown in Table 6, and found a notable disparity between girls and boys, favoring girls on most of the outcomes.

Just 12% of boys say they have supportive relationships where they can talk with someone about pubertal changes, compared with 24% of girls who say they have such supportive relationships.
Girls are also much more likely to have:

- accurate knowledge about puberty
- accurate knowledge about pregnancy risk
- equitable gender attitudes (less than half of boys meet the criterion for having equitable attitudes)
- the intention to abstain from sexual intercourse and use a condom if they do have it.
- Girls are also slightly more likely than boys to:
- say they have the ability to access SRH services, and
- have accurate knowledge about HIV risk.
- Boys are slightly more likely than girls to have accurate knowledge of and exposure to condoms.

Table 6. *Percentage of Northern Uganda Young Adolescents with SRH Outcome by Gender*

	Valid %	
	Girls, n=487	**Boys,** n=454
Accurate knowledge about puberty	72	51
Accurate knowledge about pregnancy risk	51	33
Accurate knowledge of HIV risk	76	70
Condom exposure and knowledge	62	68
Ability to access SRH service	67	60
Supportive relationships	24	12
Equitable gender attitudes	65	49
Intended sexual behavior	63	52

In addition, there were several measures which consisted of individual item frequencies, shown in Table 7. A great majority of youth had heard of HIV/AIDS and condoms, but somewhat less, 71%, reported having seen a condom. A smaller subset of youth agreed that teasing girls is an appropriate way to show girls they like them (17%) and agreed that girls should be flattered by this behavior (10%). At the same time, 40% of youth agreed that boys who do not tease girls will be teased themselves. Finally, very few to no youth reported touching and being touched without permission, respectively. Only 4% of boys reported that they had touched a girl without her permission in the past week, and only 4% of girls reported having been touched without permission. At the same time, nearly 9 in 10 (86%) reported feeling comfortable telling a boy to stop doing something with which they were uncomfortable.

Table 7. *Percentage of Northern Uganda Young Adolescents by Individual Item Measures*

	Valid % N=941
Heard of HIV/AIDS	94
Heard of condoms	83
Seen a condom	72
Agree: Teasing girls is an appropriate way boys show girls that they like them	17
Agree: Boys who do not tease girls will be made fun of by other boys	40
Agree: Girls should be flattered when boys act this way	10
Boys only – Touched a girl on the breast or buttocks without her permission in the past week	4
Girls only – Been touched by a boy on the breasts or buttocks without her permission in the past week	4
Girls only – Feel able to tell boy to stop doing something that makes them uncomfortable	86

D. Results: Correlations between DAP Scores and SRH Measures

Of great interest in this project is the extent to which young people's experience of developmental assets may be linked to better SRH outcomes. Because assets are theoretically hypothesized to be associated with better outcomes, and since such associations repeatedly have been found in empirical studies, a positive correlation between the DAP score and SRH outcomes would provide further evidence of the concurrent validity of the DAP and suggestive evidence that raising young adolescents' experience of developmental assets might have an effect on their sexual and reproductive health (a plausible speculation that would then need longitudinal study to confirm or disconfirm). Thus, we looked at the correlations or associations between the SRH outcomes and developmental assets level.

In the pilot study (described earlier), we found a number of statistically significant results for the multi-item scales (and for the single item measuring knowledge of HIV risk), with higher DAP scores related to more accurate knowledge about puberty, and more supportive relationships for both boys and girls. For the remaining eight single item SRH measures[8], the only significant correlations with total DAP score were that those with more assets were more likely to have heard of condoms, and that girls with more assets were more likely to feel comfortable telling a boy to stop unwanted touching.

In this much larger study, we also saw a number of significant correlations and/or analyses of variance showing that youth with higher levels of assets had better SRH outcomes. Specifically, youth with higher levels of assets had more accurate knowledge about puberty, more accurate knowledge about condoms, more accurate knowledge about HIV, more confidence in their ability to access SRH services, more supportive relationships in which they could talk about feelings and what happens during puberty, and greater intentions to abstain from intercourse and use a condom if they did have it.

In addition, on the single item measures, the higher girls' assets, the less likely they were to agree that girls should be flattered when boys tease them (r=.07, p=.021), and the more likely they were to say they could tell a boy to stop doing something that made the girl uncomfortable (r=.15, p=.001).

[8]Other than the item measuring knowledge of HIV risk, the other single item SRH measures were: Heard of condoms, heard of HIV/AIDS, have seen a condom, whether it is okay for a boy to tease girls, whether boys will be bullied if they do not tease girls, whether girls should be flattered by boys teasing them, whether it is okay for boys to touch girls without permission, and how comfortable girls feel telling boys to stop unwanted touching.

Table 8. *Correlation of Level of Developmental Assets with Sexual and Reproductive Health Outcomes, 10-14 Year Olds in Uganda*

Scale	Correlation Coefficient	Significance Level
Accurate knowledge about puberty	**.10**	**(.002)**
Accurate knowledge about pregnancy risk	-.00	NS
Accurate knowledge of HIV/AIDS risk	**.13**	**(.000)**
Condom exposure and knowledge	.06	NS
Ability to access SRH services	**.11**	**(.001)**
Supportive Relationships: Girls Only	**.11**	**(.019)**
Supportive Relationships: Boys Only	**.17**	**(.000)**
Equitable gender attitudes	-.04	NS
Intended sexual behavior	**.18**	**(.000)**

n=941 *Significant correlations are shown in **BOLD**

Additionally, we examined these correlations by gender, shown in Table 9. For girls, higher levels of developmental assets were related to greater knowledge about puberty, and greater perceived ability to access SRH services. For boys, higher levels of developmental assets were linked to better condom knowledge. For both girls and boys, the higher their level of developmental assets, the more they knew that HIV cannot be contracted through mosquito bites, the more they had supportive relationships with adults and friends with whom they could talk about feelings and about changes in adolescence, and the greater were their intentions to abstain from intercourse and use condoms.

Table 9. *Correlation of level of Developmental Assets with Sexual and Reproductive Health Outcomes by Gender*

	Girls, n=487		**Boys**, n=454	
	Correlation Coefficient	**Significance Level**	**Correlation Coefficient**	**Significance Level**
Accurate knowledge about puberty	**.21**	**.000**	-.004	NS
Accurate knowledge about pregnancy risk	.06	NS	-.08	NS
Accurate knowledge of HIV risk	**.10**	**.024**	**.17**	**.000**
Condom exposure and knowledge	.00	NS	**.12**	**.017**
Ability to access SRH services	**.19**	**.000**	.02	NS
Supportive relationships	**.11**	**.019**	**.17**	**.000**
Equitable gender attitudes	-.03	NS	-.06	NS
Intended sexual behavior	**.17**	**.000**	**.20**	**.000**

*Significant correlations are shown in **BOLD**

The absolute level of most of the correlation coefficients was modest, and in several cases, quite a bit less than found in the pilot study. Thus, we also conducted Anovas to examine differences in mean outcome scores by level of developmental assets (total DAP score).[9] As displayed in Table 10, youth at Thriving asset levels were better than all other youth on three outcomes (accurate knowledge of puberty, accurate knowledge of HIV, and for boys, supportive relationships), and along with youth at the Adequate level of assets, better than youth at the Vulnerable and Challenged levels on intended sexual behavior, and on ability to access SRH services. Youth at the Challenged level of assets, the lowest level, were worse than all other youth on ability to access SRH services.

[9] We also conducted regressions, using the total DAP score to predict the multi-item SRH outcomes. As would be expected, given the modest correlations reported in Tables 8 and 9, the variance in SRH outcomes explained by the DAP was quite small. Nevertheless, a number of the regressions were significant, paralleling the results reported here.

Table 10. *Mean Outcome Scores by Level of Developmental Assets, 10-14 Year Olds in Uganda*

	F	(*p* level)	Challenged	Vulnerable	Adequate	Thriving
Accurate knowledge about puberty	**(3,940)=3.18**	**(.023)**	**-.15b**	**.01a,b**	**-.02a,b**	**.12a**
Accurate knowledge about pregnancy risk	(3,940)=1.10	(.350)NS	-.05	.07	-.02	.01
Accurate knowledge about HIV	**(3,939)=6.08**	**(.000)**	**-.28c**	**-.14b,c**	**.03a,b**	**.20a**
Accurate knowledge about condoms	(3,781)=1.12	(.161)NS	-.17	.00	-.02	.10
Ability to access SRH services	**(3,940)=3.45**	**(.016)**	**-.26b**	**-.04a,b**	**-.01a**	**.09a**
Supportive relationships: Girls	(3,486)=3.14	(.025)	.08	-.03	.00	.15
Supportive Relationships: Boys	**(3,453)=4.72**	**(.003)**	**-.154b**	**-.09a,b**	**-.06a,b**	**.13a**
Equitable gender attitudes	(3,940)=1.72	(.161)	-.05	.05	.01	-.05
Intended sexual behavior	**(3,940)=12.03**	**(.000)**	**-.25b**	**-.13b**	**.08a**	**.15a**

*Significant Anovas are shown in **BOLD.**
Notes. (1) All means standardized to mean of 0 and standard deviation of 1. (2) In each row, means with differing superscripts are significantly different from each other. Means without superscripts are not different from each other.

Table 11.*Percentage of Youth Having SRH Outcomes, by Developmental Assets Level, 10-14 Year Olds*

	Challenged	**Vulnerable**	**Adequate**	**Thriving**
Accurate knowledge about puberty	54	59	63	65
Accurate knowledge about pregnancy risk	39	50	46	48
Accurate knowledge of HIV	61	68	75	82
Condom knowledge	49	66	62	72
Ability to access SRH services	49	62	66	68
Supportive relationships:				
Girls	25	20	23	33
Boys	3	10	12	19
Equitable gender attitudes	57	61	57	52
Intended sexual behavior	43	49	62	68
	N=61	N=312	N=337	N=231

Another way of examining the relation of developmental assets and SRH outcomes is to consider what the odds are of young people having the SRH outcomes, if they have desirable levels of those personal and social assets. To do so, we conducted logistic regressions, in which we used the Adequate and the Thriving level of assets to predict having the SRH outcomes. The results in Table 12 show the odds of youth at the Adequate or Thriving level of assets having the outcomes, as compared to youth at the Challenged or Vulnerable levels (column 2), and the odds of youth at the Thriving level having the outcomes, as compared to all other youth (column 3).[10]

These results show that youth at the two highest asset levels are significantly more likely than youth at the lowest two levels to have three of the outcomes (accurate HIV knowledge, access to SRH services, and intended sexual behavior). In addition, youth at the highest asset level, Thriving, are more likely than youth at all three of the other asset levels to have five of the outcomes (accurate HIV knowledge,

[10] These are the unadjusted odds, with adjusting for variables such as gender, or age within the 10 to 14 year old range.

accurate condom knowledge, supportive relationships for girls, supportive relationships for boys, and intended sexual behavior).

The practical meaning of the results is more evident in these logistic regressions than in other kinds of analyses. For example, boys at the Thriving assets level have twice the odds as all other boys (ExpB of 2.02) to have supportive relationships, and youth at least at the Adequate level of assets are 98% more likely (ExpB of 1.98) to have the intention to delay sex until marriage or to use a condom. These are quite meaningful differences that can translate to consequential differences in the sexual and reproductive health of these very young adolescents.

Table 12. *Odds of Uganda 10 to 14 Year Olds Having Sexual and Reproductive Health Outcomes, at Adequate or Thriving Levels of Developmental Assets*

	ExpB (p)*	
	Adequate-Thriving Assets Level**	**Thriving Assets Level*****
Accurate knowledge about puberty	1.30 (.057NS)	1.24 (.180NS)
Accurate knowledge about pregnancy risk	.93 (.574NS)	1.01 (.938NS)
Accurate knowledge of HIV	**1.71 (.000)**	**1.87 (.001)**
Condom knowledge	1.18 (.293NS)	**1.57 (.012)**
Ability to access SRH services	**1.34 (.035)**	1.27 (.136NS)
Supportive relationships:		
Girls (n=118 have the outcome, versus 369 do not)	1.41 (.125NS)	1.**78 (.013)**
Boys (n=56 have the outcome, versus 398 do not)	1.71 (.081NS)	**2.02 (.019)**
Equitable gender attitudes	.81 (.121NS)	.78 (.106NS)
Intended sexual behavior	**1.98 (.000)**	**1.75 (.000)**

*ExpB expresses the odds of youth having the outcome if they have either an Adequate or Thriving level of assets (column 2), or (in column 3) a Thriving level of assets. For example, youth with either an Adequate or Thriving level of assets are 71% (an ExpB of 1.71) more likely than other youth to have accurate HIV knowledge, and youth at the Thriving level are 87% more likely (ExpB of 1.87) to have accurate HIV knowledge than all other youth.
**N=510 at the combined Adequate + Thriving levels, versus 373 combined Challenged + Vulnerable
***N=232 at the Thriving level, versus 711 combined at the Adequate, Vulnerable, and Challenged levels.

DISCUSSION

This study looked at the link between youth developmental assets—relationships, opportunities, values, skills, and self-perceptions of youth--and sexual and reproductive health outcomes. The study had two main purposes: 1) document the extent to which very young adolescents in a developing world context report having those developmental assets, and 2) examine the association between having developmental assets and SRH outcomes. The alpha reliability for the developmental assets (DAP) scales showed the measures (adapted to the local language and context) performed well (other than the Empowerment scale) in the northern Ugandan context.

Substantively, we focused on the association between those assets and measures of knowledge of puberty and fertility, HIV knowledge, intended sexual behavior, confidence accessing SRH services, and other gender-linked outcomes among a large sample of northern Ugandan 10 to14 year olds. We hypothesized that higher levels of developmental assets would be linked with better concurrent SRH outcomes.

Although this was a correlational and not a longitudinal study that can more firmly establish cause and effect, many of the findings supported our hypotheses. We found that while most youth did not meet cutoffs for "having" SRH outcomes, youth with higher levels of developmental assets had more

accurate knowledge about puberty, more accurate knowledge about HIV risk, more perceived ability to access SRH services, more supportive relationships in which they could talk about feelings and what happens during puberty, and lower intentions to engage in risky sexual behavior. In addition, girls were more likely than boys to have most of the SRH outcomes, with the exception of accurate knowledge of and exposure to condoms, which boys were slightly more likely to have relative to girls.

There were also findings that were not expected. One was the low reliability for the Empowerment subscale. In particular, the barely "promising" alpha reliability coefficient suggests a problem with the adaptation of the items in this scale, or, that the construct itself may not be relevant or applicable to the youth in this sample.[11] The low alpha score may be due to context, that is, the concept might not be appropriate in some way to this Ugandan setting. In other IRH data, very young adolescents in Uganda also self-report feeling very unsafe in their communities, which may be due to their post conflict setting, and to the documented high levels of violence and harsh punishment of children in this region (Mulumba, 2011; Naker, 2005). This feeling of being unsupported in their community environment is also supported by the relatively low levels of responses to the community context scale, relative to other scales.

Another unexpected finding was that the overall DAP response distribution was somewhat biased to the high end, with the school context and Commitment to Learning scales reported at thriving levels for many youth in the sample. As with other DAP studies in Uganda, these self-reported levels are higher than most other DAP studies that we have conducted outside of Uganda. As mentioned earlier, these could reflect actual youth experiences, or youth responses could be influenced by values around education or even by the fact that the survey was administered at their schools. However, as suggested earlier, the positive results may not be biased at all. Basic education was put into law in Uganda only in 1987, and it is still highly valued. The youths' responses may therefore not be biased at all, but simply an accurate reflection of these youths' cultural reality and the cultural value placed on education in Uganda. This is consistent with other Search Institute DAP studies in Uganda, in which the survey administrations were not conducted in school settings. In addition, while youth in the sample did report high levels for the school and learning-related scales, the relatively lower levels for the community context scale and items provide some evidence that any positive bias or influence was not across all measures.

We did find, for most of the outcomes, significant associations between level of developmental assets experienced, and desirable SRH outcomes. However, there were some associations, particularly within the Equitable Gender Attitudes items, that were not significant. For the SRH indices (including Equitable Gender Attitudes), we also looked at the correlation of single items with the total level of developmental assets (the total DAP score), by gender. We found that youth reporting higher levels of developmental assets were more likely to say that it is unmanly for a boy to do housework (entirely due to boys' agreement), and that it is ok for a boy to slap or hit a girl (entirely due to girls' agreement). These results run counter to the hypothesized relationship, and even contradict other associations—for example, girls with higher levels of developmental assets (higher DAP scores) were less likely than other girls to agree that it is more important for girls to do housework than to study. Thus, at the same time, girls with higher asset levels place a higher importance on girls' access to education, while maintaining a belief that it is acceptable for boys to use violence against them.

This was the first study to examine gender egalitarian attitudes and developmental assets, and it was conducted in a non-U.S. context. In the U.S. context, in which the assets framework was developed, research has consistently shown that girls experience more assets than boys. Moreover, because the assets include a focus on positive relationships with others as well as on specific attitudes such as all people being treated equally, it was reasonable to hypothesize that higher levels of developmental

[11]The following items make up the Empowerment scale: I feel safe and secure at home; I feel valued and appreciated by others; I feel safe at school; I am included in family tasks and decisions; I am given useful roles and responsibilities; I have a safe neighborhood. All items have the possible responses: Not At All or Rarely; Somewhat or Sometimes; Very or Often; Extremely or Almost Always.

assets would theoretically be related to more egalitarian gender attitudes, and perhaps even more so among girls. So, from that perspective of what would be predicted in the U.S. context, some of these results were contradictory and puzzling. In the Ugandan context, however, the results might not be as surprising, for several reasons.

First, the survey did not include clear instructions asking youth to respond with whether they personally agreed or disagreed with these gender equity statements, and youth with higher levels of assets might have been using as a reference point how wider Ugandan society feels on the statements. Because youth with higher levels of assets would be expected to be more socially perceptive and skilled, these youth may have been responding, not about how they personally feel, but about their perceptions of their society's general attitudes. It may be that Ugandan society communicates ambiguous sets of gender-related attitudes, more clearly teaching youth that girls' education is important, while still reinforcing a belief that violence against girls is acceptable. Since gender-based violence is common in northern Uganda (Uganda Bureau of Statistics and ICF International, 2012), even those very young adolescents with high levels of developmental assets live in a society with both rigid gender norms in general, and, specifically, socially-sanctioned norms of violence, making those norms especially hard to overcome.

Another possibility is related to the wording of the gender items in particular, which in contrast to many of the other SRH or DAP items, often require disagreement for the gender equitable response (e.g. 'It is OK for a boy to slap or hit his girlfriend if she does not follow his orders,' or, 'A boy who does housework is not considered a real man'). At the very least, these items tended to use more complex clauses as compared to other items in the survey. Other than explanations such as these, it is difficult to reconcile why youth with higher levels of assets, which connote having supportive relationships and opportunities, as well as positive values, positive identity, and social skills, would hold such contradictory attitudes related to gender equity.

One of the more interesting and useful findings from a positive youth development and public health program and policy standpoint was that, for both girls and boys, higher levels of assets were related to greater intentions to abstain from intercourse and use condoms if they were sexually active. When the study was originally designed, we had planned to include more measures related to sexual activity and behavior. However, pilot results (with only 1 or 2 youth out of 128 reporting any sexual activity) suggested that this would not be feasible, whether due to the young age of the youth, or due to their reluctance to disclose such activity to an interviewer. Thus, for the full study, a new measure of intention to delay sex was created. In order to meet the criterion for having the desired intentions about sexual behavior, youth had to say both that they intended to delay having sex until marriage, and that, if they did have sex prior to marriage, they would use a condom. We did not use their responses to "best age for marriage" to filter these responses, so all youth answered these questions about delaying of sex, and using a condom. Recall that the majority of the sample was 13 or younger, the majority said age 21 or older was the ideal age to get married, and nearly half said they personally would get married at age 30 or older. Thus, it may be quite unrealistic for them to actually delay having sex until marriage when marriage may be so far away in time. An intention to delay sex until marriage may be a more realistic measure when marriage is not all that far in the distance. In this sample, however, marriage is many years away. Given how long most of these very young adolescents plan to wait for marriage, intended use of condoms when they do have sex may be a more realistic and valid measure of desirable intentions about sexual behavior than a pledge of abstinence that would have to be fulfilled over more than a decade of waiting to have sex.

Nevertheless, the most certain way to avoid unplanned pregnancy and sexually transmissible diseases is use of a condom, and so, while imperfect, our attempt to measure developmentally desirable intentions about sexual behavior is not without merit or validity. It is a challenge to develop valid SRH measures for a sub-group of youth—very young adolescents—most of whom either are not or are unwilling to admit being sexually active, and among whom, given the differences between 10 and 14 year olds, there are large variations in biological and psychological determinants of SRH, and life circumstances affecting SRH choices. Under the circumstances, our combination of intention to delay,

and intention to use condoms, may be a reasonable measure. In addition, the fact that higher levels of developmental assets were related to less risky sexual behavior intentions for both girls and boys suggests that the assets may be a protective influence for *both* genders.

Moreover, the finding linking developmental assets levels and intentions about sexual behavior in a sample of very young northern Uganda adolescents is also quite similar to the results of a large U.S. study of middle and high school students, which showed that higher developmental assets levels were significantly associated with self-reported actual abstinence from sexual intercourse, and self-reported use of contraception among those who did report having intercourse (Benson, Scales, Roehlkepartain, & Leffert, 2011). The cross-cultural similarity of these associations suggests the validity of the connection between assets and less risky developmental paths of sexual and reproductive behavior.

That the correlation between higher asset levels and intentions to be sexually responsible was among the highest seen (even though the absolute level was still modest), and that it was parallel to the U.S. results for actual self-reported sexual behavior, is an indication of a possible meaningful relationship between having assets and SRH well-being. This is especially so when considered in the context of how consistent most of the other findings were, showing higher assets levels also to be significantly correlated with greater knowledge of puberty, pregnancy risk, HIV risk, and confidence accessing SRH services, all of which are mechanisms that promote adolescent sexual and reproductive health.

Moreover, odds ratios showed that these SRH differences by asset level were meaningful in terms of size: Adolescents who had at least Adequate levels of developmental assets were 71% more likely to have accurate HIV knowledge, 34% more likely to believe they could access SRH services, and 98% more likely to intend to delay sex until marriage or use a condom, than were youth at the Challenged or Vulnerable asset levels. Youth at the highest asset level, Thriving, were also 57% more likely to have accurate condom knowledge and 78% (girls) and 102% (boys) more likely to have supportive relationships, than all other youth. The size of these differences based on developmental assets level can translate into consequential differences in the sexual and reproductive health of these very young adolescents.

Thus, with a few exceptions (notably, the mixed findings for equitable gender attitudes, which can largely be explained by strong gender-linked norms in Uganda), the majority of our findings suggest a potential utility for promoting positive relationships and opportunities for youth, as well as promoting positive commitments to learning and a variety of social competencies and values, as a strategy for promoting SRH among very young adolescents in a developing country setting. This study's findings must be replicated in a longitudinal study for cause-effect conclusions to be drawn, but they also are consistent with findings from an earlier Search Institute USAID-funded study of developmental assets and youth well-being in developing/post-conflict countries. In that study, higher levels of assets (measured using the DAP survey used in the current study) were significantly correlated with various concurrent workforce development, education, health, violence prevention, and civic development outcomes among more than 3,000 youth and young adults in Bangladesh, Honduras, Jordan, and Rwanda (Scales, Roehlkepartain, & Fraher, 2012). The robustness of these findings in cross-sectional correlational research suggests that there is a plausible likelihood of observing the same link with longitudinal research designs. USAID's current youth development policy (USAID, 2012), in part drawing on that earlier study's findings, calls for, among other approaches, such investment in building youth's developmental assets—their external relationships and opportunities, and their internal values, skills, and self-perceptions—to be part of a broad strategy for promoting positive youth development in developing countries. In combination with the previous study's findings, the current study's results offer additional evidence for the potential utility of that policy for promoting and enhancing young people's well-being worldwide.

Implications for Programs and Research

These research results confirm the need to develop multi-layered approaches that work on the individual level and beyond, such as working with communities and parents, in supporting positive

development of adolescents. Consideration of the social, political and economic context is always crucial in designing interventions for any group, but particularly for young adolescents whose risks, resources and opportunities are closely linked to their family and community. The vulnerability of young adolescents stems from their dependency on family and community. These findings highlight the need to ensure programs are sensitive to the differential vulnerabilities of girls versus boys, such as in this case, addressing the limited social support among boys. Other strategies for interventions are implicated, such as:

- Working with parents to improve their ability to provide their children support, respect and set and monitor appropriate boundaries.
- Providing human rights-based programming that promotes community engagement and encourages youth to become involved in community service and action
- Employing activities which provide youth opportunities to learn and develop new skills
- Establishing linkages with caring adults in schools, communities and other institutions to increase social support for youth.

In terms of additional research, these findings implicate the need for longitudinal data to verify these results, and to establish a causal relationship between assets and SRH outcomes, as mentioned. These results point to other useful research initiatives such as:

- Studies to test and refine the SRH indicators particularly those related to sexual behavior among this younger and under-studied age group
- Pilot test interventions designed to address the assets and deficits identified in this study using quantitative and qualitative evaluation methods to better understand the mechanisms through which developmental assets affect SRH outcomes, across rural and urban areas and in different cultural contexts.

APPENDIX 1

Internal Consistency Reliability for DAP Scales from Pilot Study

The following table shows the pilot results for internal consistency reliability of the DAP scales.

Table A1. *Alpha reliabilities of DAP scales*

	Total *n*=128	Individual	Group
Total DAP Scale	**.92**	**.91**	**.90**
External	**.85**	**.84**	**.82**
Internal	**.86**	**.84**	**.84**
ASSET CATEGORIES			
Support	.63	.66	.54
Empowerment	.62	.55	.70
Boundaries & Expectations	**.72**	**.73**	.65
Constructive Use of Time	.54	.49	.38
Commitment to Learning	.68	.65	.61
Positive Values	**.70**	**.70**	.69
Social Competencies	.61[12]	.53	.59
Positive Identity	.54	.47	.56
CONTEXT VIEW			
Personal	.69	.65	.68
Social	**.79**	**.75**	**.77**
Family	**.72**	**.74**	**.70**
School	**.76**	**.74**	.65
Community	**.78**	**.71**	**.77**

*Red indicates unacceptable alpha coefficients, or <.60.

SRH Outcome Scoring and Frequencies by Individual Item

Table A2 outlines the scoring used for the SRH outcome measures. All other items were presented as item frequencies:

- Girls only Section 3, item 6 (have had period), descriptive only
- Girls only item 7 (comfort managing period), 1 point for yes
- Girls only item 8 (school days missed due to period), 1 point for no
- Boys only Section 3, item 12 (nocturnal emission), descriptive only
- Boys only item 13 (understand what was happening), 1 point for yes
- Boys only item 14 (could explain it to a male friend), 1 point for yes

[12] A number of total alphas were slightly higher than either of the alphas by method, for the same construct. Because alpha depends on the number of items and the ratio of item covariance to total variance of the set of scale items, not on sample size, this cannot be due to the larger n of the full sample. Rather, these anomalies may best be seen as fluctuations due to the measurement error inherent in any statistic.

Table A2. *Scoring for SRH Outcome Measures*

Measure	Survey item	Scoring
Accurate knowledge about puberty	Section 3:1,2,3,10	1 point for true on 1,2; 1 point for yes on 3,10, so binary is mean of those ≥ .75
Accurate knowledge about pregnancy risk	Section 3: 4,5,9,11	1 point for yes on 4,5,9,11, so binary is mean of those ≥ .75
Accurate knowledge of HIV/AIDS risk	Section 3: 16	1 point for no on 16, so binary is 16 = 2
Condom exposure and knowledge	Section 3: 19,20	1 point for agree on 19,20, so binary is BOTH 19, 20 = 1
Accessing SRH services	Section 3: 21 Section 4: 1-4	1 point for agree on 21,1-4, so binary is mean of those ≥ .80
Supportive Relationships: Girls	Section 5: 1,2,4,5	1 point for ANY answer other than "I would not talk to anyone" for 1, plus 1 point for each yes on 2,4,5 (girls) or 3,4,5 (boys), so binary is mean of those ≥ .75
Supportive Relationships Boys	Section 5: 1,3,4,5	1 point for ANY answer other than "I would not talk to anyone" for 1, plus 1 point for each yes on 2,4,5 (girls) or 3,4,5 (boys), so binary is mean of those ≥ .75
Equitable Gender Attitudes	Section 6: 1-9	1 point for agree (response 1) on 5, plus 1 point for disagree (response 2) on 3,4, 6,7,8, so binary is mean of all those ≥ .80
Intention to delay sex or use condom	Section 8: 5,6	1 point for No on 5, and 1 point for Yes on 6

Analyses use a combination of both continuous scoring (mean scores), and binary scoring to reflect whether youth meet a criterion for a desired level of the variable/outcome, that is, they "have" the outcome or they do not "have" it.

These are aspirational levels that we wish all our children to achieve for their well-being. Based on Search Institute's numerous studies showing the significant difference in well-being when youth achieve about 3/4 of the possible components of well-being (such as 31 or more of the 40 individual developmental assets), we typically set the cutoff for "having" a measure to be at the 3rd response in a 4 response Likert scale, or the 4th in a 5 response scale, or the "right" response in 3 out of 4 items in a 4-item scale.

Thus, if we are always giving "1" to the desired response in these SRH items, and a 0 to anything else, the cutoff for "having" an SRH outcome measured by 4 outcomes would be mean GE .75.

Tables A3 and A4 include frequencies for the items which make up the SRH outcomes in Table A2.

Table A3. *Percentage of Northern Uganda Young Adolescents with SRH Outcomes[13] and by Item*

	Criteria for outcome	Valid %
Accurate knowledge about puberty	*Correctly answers three of four knowledge questions*	62
True or false, is it normal for boys and girls to experience changes in their body at different times.		82
Boys have their first ejaculation between the ages of 10 and 14.		53
Is it normal for girls to have periods come earlier or later than expected each month?		57
Are these normal changes for boys during puberty?		72
Accurate knowledge about pregnancy risk	*Correctly answers three of four knowledge questions*	47
Can Jackie get pregnant the first time she has sex?		40
If Jackie had sexual relations, could she become pregnant on any day of her cycle?		61
If John had sexual relations with a girl could he get her pregnant?		64
Can a boy get a girl pregnant on any day of her menstrual cycle?		56
Accurate knowledge of HIV risk	*Answers false that HIV can be transmitted by mosquito bite*	73
Can people get HIV/AIDS from mosquito bites?		73
Condom exposure and knowledge	*Answers true to condom can prevent pregnancy, and can prevent HIV/AIDS*	65
Agree or disagree: A condom can prevent pregnancy.		73
Agree or disagree: A condom can prevent getting HIV.		80
Ability to access SRH services	*Answers four of five questions in the direction of agreeing they can access various ASRH services*	63
Agree or disagree: I know where to go to get condoms.		61
I know where to go to get an HIV test.		86
I know where to go to get information and advice on how to avoid getting pregnant/impregnating a girl.		66
I can reach these health services without much difficulty.		73
I am confident that I could obtain these health services if I wanted to.		77
Supportive relationships: Girls only*	*Can talk with adults, friends, about changes in adolescence, feelings, and romantic relationships*	24
During the last 6 months have you asked any adult about changes in your body during adolescence or romantic relationships?		79
In the last 3 months, have you talked to anyone about how to take care of yourself during your period?		50
Do you have female friends you trust with whom you can talk about feelings and personal matters?		92
Do you have male friends you trust with whom you can talk about feelings and personal matters?		19
Supportive relationships: Boys only**	*Can talk with adults, friends, about changes in adolescence, feelings, and romantic relationships*	12
During the last 6 months have you asked any adult about changes in your body during adolescence or romantic relationships?		88
During the last 3 months, have you talked to someone about how to take care of yourself once you start having wet dreams?		18
Do you have female friends you trust with whom you can talk about feelings and personal matters?		30
Do you have male friends you trust with whom you can talk about feelings and personal matters?		86

[13] A number of other outcomes all were deemed to be best considered as single items, and are discussed below.

Equitable Gender Attitudes	*Answers six of seven attitude questions in the direction of supporting equality between males and females*	57
It is ok for a boy to hit or slap his girlfriend is she does not follow his orders. (Disagree)		75
If someone insults a boy, he should defend his reputation with force even if he is small. (Disagree)		77
It is equally important for girls to go to school as it is for boys. (Agree)		98
A boy who does housework is not considered a real man. (Disagree)		65
A boy should have more free time than girls. (Disagree)		53
It is more important for a girl to help at home and learn household activities than to spend time studying. (Disagree)		92
Intended sexual behavior	*Expects to delay sex until marriage, and to use a condom if having sex before marriage*	58
Do you think you will have sex before you get married?		76
If you ever have sex before marriage, would you use a condom?		77
Note: (n=941), unless otherwise noted. *n=487; **n=454		

Table A4. *Percentage of Northern Uganda Young Adolescents with SRH Outcomes[14] and by Item, by Gender*

		Valid %	
	Criteria for outcome	**Girls**	**Boys**
Accurate knowledge about puberty	*Correctly answers three of four knowledge questions*	72	51
True or false, is it normal for boys and girls to experience changes in their body at different times.		85	80
Boys have their first ejaculation between the ages of 10 and 14.		56	51
Is it normal for girls to have periods come earlier or later than expected each month?		73	39
Are these normal changes for boys during puberty?		78	66
Accurate knowledge about pregnancy risk	*Correctly answers three of four knowledge questions*	51	33
Can Jackie get pregnant the first time she has sex?		46	34
If Jackie had sexual relations, could she become pregnant on any day of her cycle?		73	49
If John had sexual relations with a girl could he get her pregnant?		68	59
Can a boy get a girl pregnant on any day of her menstrual cycle?		66	46
Accurate knowledge of HIV risk	*Answers false that HIV can be transmitted by mosquito bite*	76	70
Can people get HIV/AIDS from mosquito bites?		76	70
Condom exposure and knowledge	*Answers true to condom can prevent pregnancy, and can prevent HIV/AIDS*	62	68
Agree or disagree: A condom can prevent pregnancy.		69	76
Agree or disagree: A condom can prevent getting HIV.		78	82
Ability to access SRH services	*Answers four of five questions in the direction of agreeing they can access various ASRH services*	67	60
Agree or disagree: I know where to go to get condoms.		58	66
I know where to go to get an HIV test.		86	86
I know where to go to get information and advice on how to avoid getting pregnant/impregnating a girl.		75	57

[14] A number of other outcomes all were deemed to be best considered as single items, and are discussed below.

I can reach these health services without much difficulty.		76	71
I am confident that I could obtain these health services if I wanted to.		80	74
Equitable Gender Attitudes	*Answers six of seven attitude questions in the direction of supporting equality between males and females*	65	49
It is ok for a boy to hit or slap his girlfriend is she does not follow his orders. (Disagree)		78	73
If someone insults a boy, he should defend his reputation with force even if he is small. (Disagree)		78	75
It is equally important for girls to go to school as it is for boys. (Agree)		99	96
A boy who does housework is not considered a real man. (Disagree)		69	60
A boy should have more free time than girls. (Disagree)		65	41
It is more important for a girl to help at home and learn household activities than to spend time studying. (Disagree)		94	89
Intended sexual behavior	*Expects to delay sex until marriage, and to use a condom if having sex before marriage*	63	52
Do you think you will have sex before you get married?		83	68
If you ever have sex before marriage, would you use a condom?		76	79

Additional Analyses of Key SRH Items

Even though the SRH measures were not intended to be scales, several of them did have acceptable scale-like psychometric properties. For the measures that did not (condom knowledge, equitable gender attitudes, and supportive relationships), we examined frequencies for their constituent items, and the correlations of those single items with the total DAP score.[15] Table A5 shows that a majority of 10 to14 year olds gave the criterion (desired) response to most of these items. However, only 17% had talked with anyone in the last six months about romantic relationships or changes during adolescence, and only 18% of boys had talked with anyone in the past 3 months about wet dreams (in contrast, 51% of girls had talked with someone in the last 3 months about periods).

Table A5. *Percentage Providing Desired Response to Single Items from Low-Reliability SRH Scales*

	Valid %
Have seen a condom (yes)	72
Condoms can prevent pregnancy (agree)	73
Condoms can prevent HIV/AIDS	80
It is OK for a boy to slap or hit his girlfriend if she does not follow his orders (disagree)	75
It is OK for a boy to use force to defend his reputation (disagree)	77
A boy who does housework is not considered a real man (disagree)	65
Boys should have more free time than girls (disagree)	53
It is more important for girls to do housework than to study (disagree)	92
Have talked with someone in last 6 months about romantic relationships or changes during adolescence (yes)	17
Have talked with someone in last 3 months about periods (girls only)	51
Have talked with someone in last 3 months about wet dreams (boys only)	18
Have trusted female friends with whom can talk about feelings and personal matters	62
Have trusted male friends with whom can talk about feelings and personal matters	51

[15] In addition, there were a few single items, which we also correlated with the total DAP score, including whether a girl had started having periods, whether a boy had experienced a wet dream, whether girls felt confident they could manage their period, and whether boys understood what was happening when they had a wet dream, and whether girls had missed more than three days of school because of their periods. All these items' correlations with the DAP score were in the -.03 to .09 range, and none reached significance at $p \leq .05$.

Finally, we examined the correlation of scores on those single items from selected SRH measures with the total DAP score, both for the total sample of 10-14 year olds, and for girls and boys. Table A6 shows that seven of the 13 single items were significantly correlated with DAP scores. For five of the seven items, the higher the DAP score, the more likely youth were to give the desired response (more knowledge of condoms, more equitable gender attitudes, and more frequent supportive relationships).

However, there were some results that would be unexpected in a U.S. context, but are not as puzzling in the northern Uganda context, as described earlier. For example, the higher the DAP score, the more likely youth were to say that it is unmanly for a boy to do housework (entirely due to boys' agreement), and that it is ok for a boy to slap or hit a girl (entirely due to girls' agreement). These relationships were found, side-by-side with the finding that girls with higher DAP scores were less likely than other girls to agree that it is more important for girls to do housework than to study. Thus, at the same time that girls with higher asset levels placed a higher importance on girls' access to education, they also maintained a belief that it is acceptable for boys to use violence against them.

Table A6.*Correlation (R) of Single Items from Selected SRH Items with Total DAP Score, Overall, and by Gender*

	Overall R (p level)	Males	Females	Meaning
Condoms can prevent pregnancy (agree)	**.09 (.013)**	**.15 (.004)**	.05NS	Higher DAP, more knowledge (supports hypothesis)
Condoms can prevent HIV/AIDS	.00NS	.06NS	-.04NS	
G3: It is OK for a boy to slap or hit his girlfriend if she does not follow his orders (agree)*	**.08 (.010)**	.05NS	**.11 (.012)**	Higher DAP, more agree (contrary to hypothesis)
G4: It is OK for a boy to use force to defend his reputation (agree)*	.04NS	.07NS	.00NS	
G6: A boy who does housework is not considered a real man (agree)*	**.11 (.000)**	**.17 (.000)**	.06NS	Higher DAP, more agree (contrary to hypothesis)
G7: Boys should have more free time than girls (agree)*	-.03NS	-.09NS	.01NS	
G8: It is more important for girls to do housework than to study (agree)*	**-.08 (.016)**	-.05NS	**-.13 (.005)**	Higher DAP, more disagree (supports hypothesis)
Have talked with someone in last 6 months about romantic relationships or changes during adolescence (yes)	**.10 (.003)**	**.09 (.052)**	**.10 (.032)**	Higher DAP, more talking (supports hypothesis)
Have talked with someone in last 3 months about periods (girls only)	**.14 (.002)**	**---**	**.14 (.002)**	Higher DAP, more talking (supports hypothesis)
Have talked with someone in last 3 months about wet dreams (boys only)	**.19 (.000)**	**.19 (.000)**	**---**	Higher DAP, more talking (supports hypothesis)
Have trusted female friends with whom can talk about feelings and personal matters	.04NS	-.09NS	-.03NS	
Have trusted male friends with whom can talk about feelings and personal matters	-.01NS	.01NS	-.00NS	

*Note: Scoring for asterisked items was such that the desired correlation would have a negative sign.

APPENDIX 2

Definitions of Technical Terms

Response variability—The degree to which youth choose reasonable numbers of each response option to a survey question, instead of there being a lopsided amount for response to just one or two response choices. For example, if a question has response options of Strongly Agree, Agree, Disagree, and Strongly Disagree, an ideal response distribution would be 25% of youth choosing each of those options. Poor response variability would be illustrated by 70% choosing Strongly Agree and another 15% Agree. Items should have good response variability rather than a lopsided or "skewed" distribution.

Reliability—The degree to which the items in a scale "hang together" statistically by youth responding to them with similar response choices. For example, if a scale is made up of four items, each having Strongly Agree-Strongly Disagree response choices, if youth respond Agree to one of the items, they should also respond Agree to the other three items. The more the responses are the same to different items that make a given scale, the more "internally consistent" or "reliable" the scale is said to be.

Validity—The degree to which an item or scale measures the concept it is supposed to be measuring, and whether the item or scale correlates or links to other concepts in the ways previous research or theory would predict. For example, previous Search Institute research shows that high asset scores are linked to better outcomes. So, if the asset measures used in this study are valid, they too should be linked to better outcomes. The results bear this relationship out, and so the survey has demonstrated good validity.

Statistical Significance—The mathematical calculation of the degree to which a difference between scores could <u>not</u> have been found by chance, and is therefore likely to be a "true" result. Significance levels are indicated by the symbol "p < XXXX" or p = .XXXX. For example, a " p < .001" symbol means there is less than (<) 1 chance in 1,000 that this observed difference between two groups is due to chance. In other words, there is a 999 out of 1,000 chance that this difference is true and real. Statistical significance is not the same as practical significance. In very large samples, numbering in the thousands, even very small differences can be statistically significant, but because the size of the differences are so small, in reality they have little practical significance for program planning or other actions. In contrast, when the samples being compared are small in absolute numbers of youth, it takes quite large differences in scores to reach statistical significance. In other words, a difference could be practically meaningful (relatively large) but not be technically significant (because the absolute numbers of youth are too small). Applying their local knowledge of the youth and available programs can help program planners and leaders to determine whether a result that is not technically significant may still be quite important to address.

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