

Recycling Behavior Among Urban South Africans: The Role of Race and Social Status

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Focus of This Study

- This is a study of recycling behavior among urban African and non-African households in South Africa, based on data collected in 2003 and 2005.
- It examines how social status and race are related to household recycling.
- It also examines the role of the perception of littering as a problem and the ease of recycling in recycling decisions.
- Additionally it examines the relation of the presence of a child in elementary or secondary school in the household to recycling behavior.

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Summary of Findings

- African households are more likely than non-African households to perceive littering as a community problem, but non-African households are more likely to recycle.
- Education is **positively** related to whether a non-African household recycles but **negatively** related to whether an African household recycles.
- For both African and non-African households, education is positively related to recycling for non-money reasons and negatively related to recycling for money reasons.
- The positive relation between education and recycling for non-money reasons is much stronger for non-African than for African households.
- For both African and non-African households, regardless of the reason for recycling, proximity of a recycling center and presence of a school or community recycling program are positively related to household recycling.
- For African households, the presence of a child in elementary or secondary school is positively related to recycling.
- Making recycling easier to accomplish and increasing and improving school recycling education would be likely to increase household recycling, especially among African households.

South African Constitution and Recycling

In the 1996 South African Constitution is a comprehensive set of human rights, among which is the right of South African citizens:

- "a. to an environment that is not harmful to their health and well-being; and
- b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative acts and measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (Constitution of South Africa, Chap. 2. Sec. 24).

It is unclear what the influence on recycling behavior of South Africans are of:

1) the Constitutional provisions

or

2) the legacy of apartheid, during which the state had little commitment to the welfare of Africans

High Percent of Beverage Cans Recycled

- South Africa has a high level of recycling of metal beverage cans, estimated as 80-90% in 2004.
- Much of this recycling is by individual entrepreneurs, rather than as a result of recycling of cans by a large proportion of households.

Earlier Research on Recycling

- In developed countries, higher social status has usually been positively related to recycling.
- Only recently has there has been much research on the level of recycling in neighborhoods with a large minority population. There has been less work on variations in recycling within racial or ethnic groups in relation to SES.
- There has been little research on recycling behavior in less-developed countries.

Data Sources

- This analysis is based on data for the urban population of South Africa from the 2003 and 2005 General Household Surveys, carried out by Statistics South Africa.
- They are stratified random samples of all of South Africa, covering over 15,000 urban households in each survey.
- The data from the 2003 and 2005 surveys are merged. Appropriate sample weights are applied and these weights are scaled to the actual number of cases in each survey.
- The required questions were not in the 2004 survey.

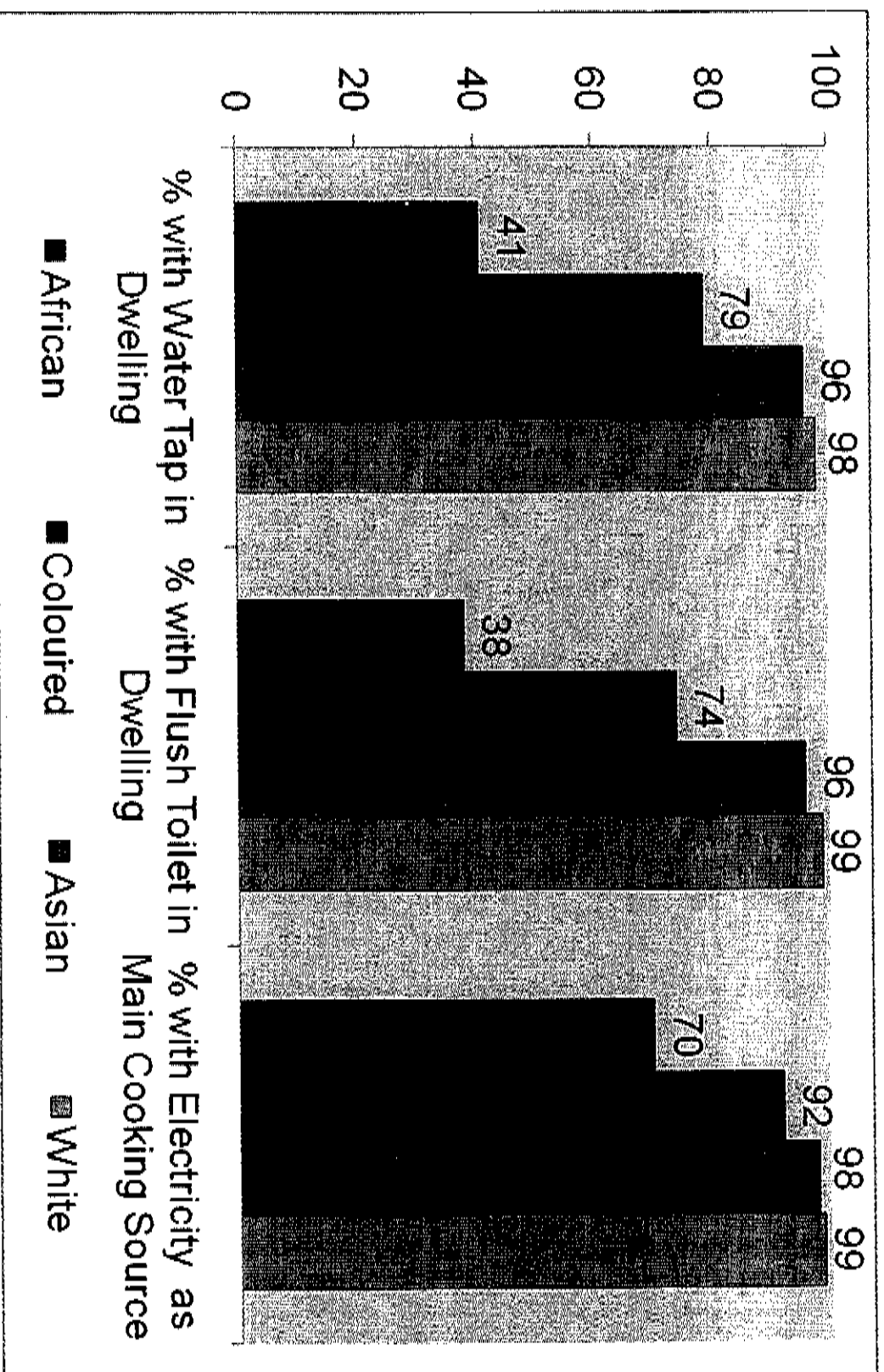
Population Groups in South Africa

- The new South African government came to power in 1994, ending apartheid.
- There were four officially recognized population groups under apartheid – Whites, Asians, Coloured and Africans.
- Under apartheid:
 - Life was organized for the benefit of Whites.
 - Africans refers to Bantu-background black Africans. Africans were under the most onerous restrictions and could not legally live in cities until 1985. There were fewer restrictions on those who were Coloured and even fewer on Asians.
 - Asians are primarily from India, but also include Chinese and other Asian-origin groups.
 - Coloured are a mixed race group originating 300 years ago from the descendants of Portuguese, Malaysians and other European and Asian groups and members of various African ethnic groups, especially the Khoikhoi.
- Socio-economic differences among population groups from the apartheid era persist to the present day.

Restriction of Analysis to Urban Households

- This analysis is restricted to urban households.
- Recycling centers are rarely present in rural areas.
- Examination of recycling among rural residents would require a separate analysis.

Characteristics of Urban Households by Population Group of Household Head, 2003 and 2005



White and Asian households are better off than Coloured or African households. Coloured households are better off than African households.¹¹

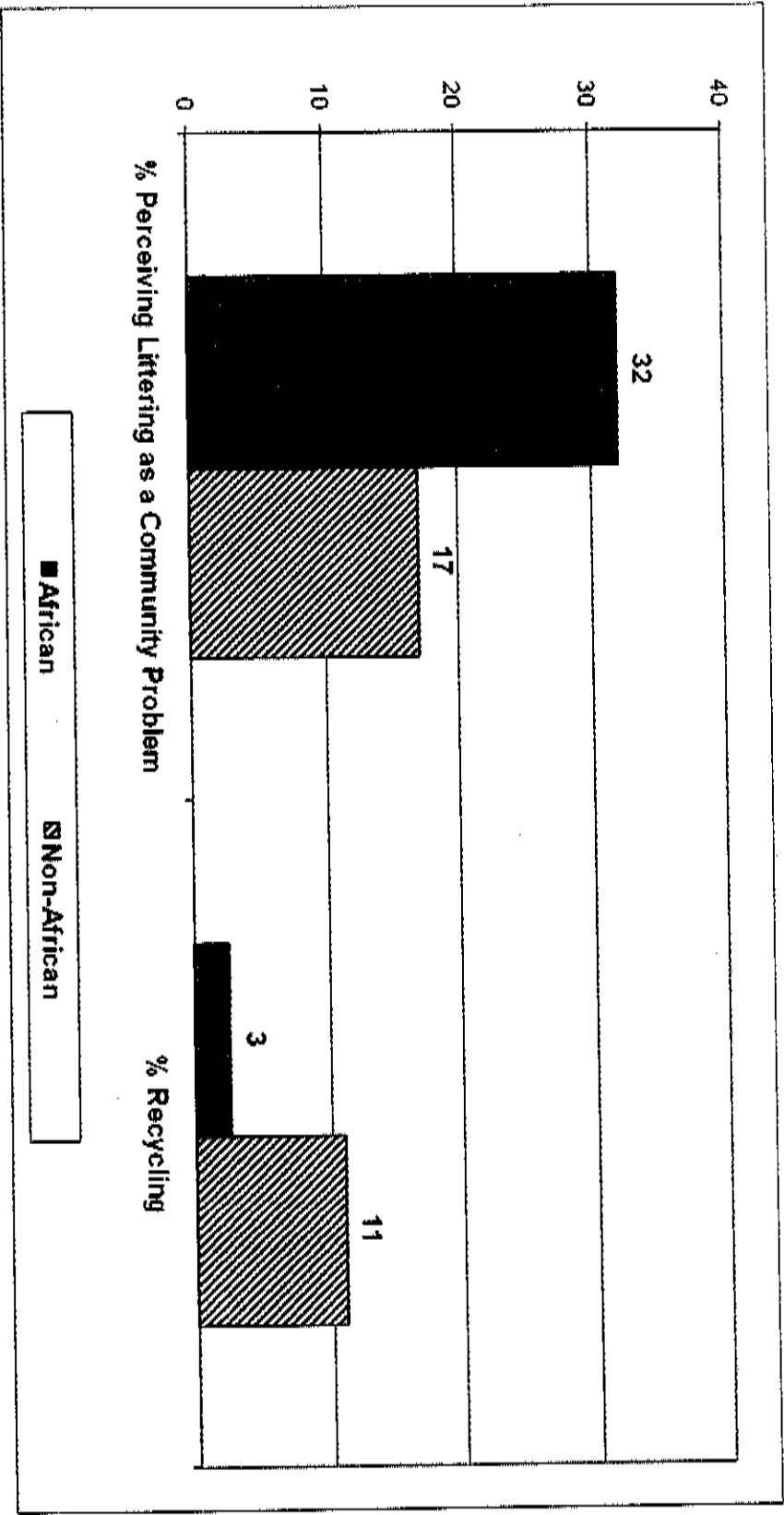
Unweighted and Weighted Distribution of Urban Households by Population Group of Household Head in the 2003 and 2005 General Household Surveys

Group	Number of Households	% Distribution in Sample	% by Population Group in Weighted Sample
African	20,396	65.6	67.1
Coloured	4,842	15.6	10.8
Asian	1,093	3.5	3.9
White	4,706	15.1	18.3
Other	23	.1	
Missing	39	.2	
Total	31,089	100.0	100.0

Data are weighted to the actual number of cases in each survey.

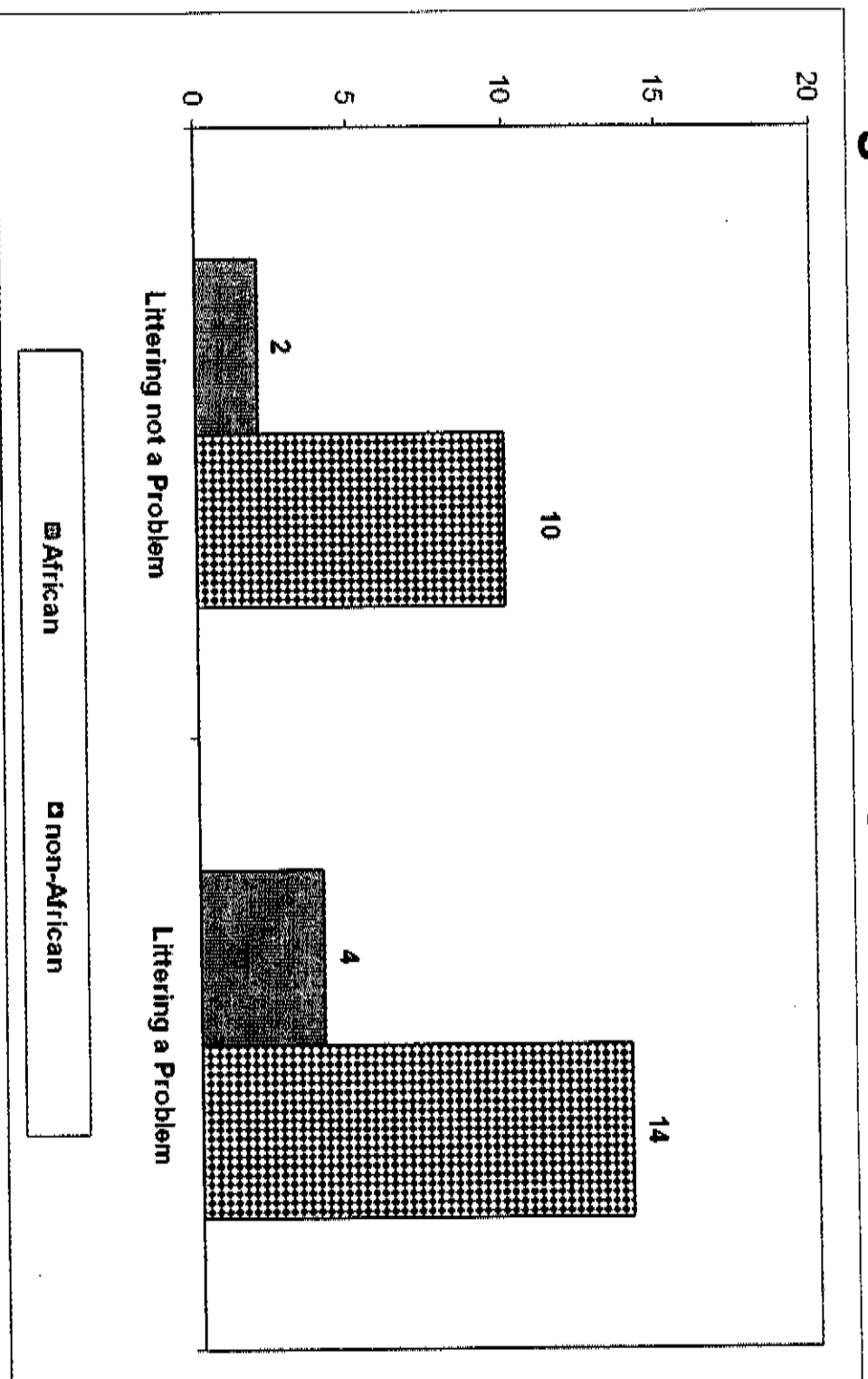
- In the rest of the analysis the population is divided into African households and non-African households – non-African households include White, Asian and Coloured households.
- White and Asian households have very similar characteristics, and there are few Asian households.
- Analysis separately for Coloured households showed patterns between those of White and Asian households and those of African households but closer to the patterns for White and Asian households.
- Recall that only Africans were banned from urban residence during the apartheid period.

Percent of Urban Households Perceiving Littering as a Community Problem and Percent Recycling by African/non-African Household Head, 2003 and 2005



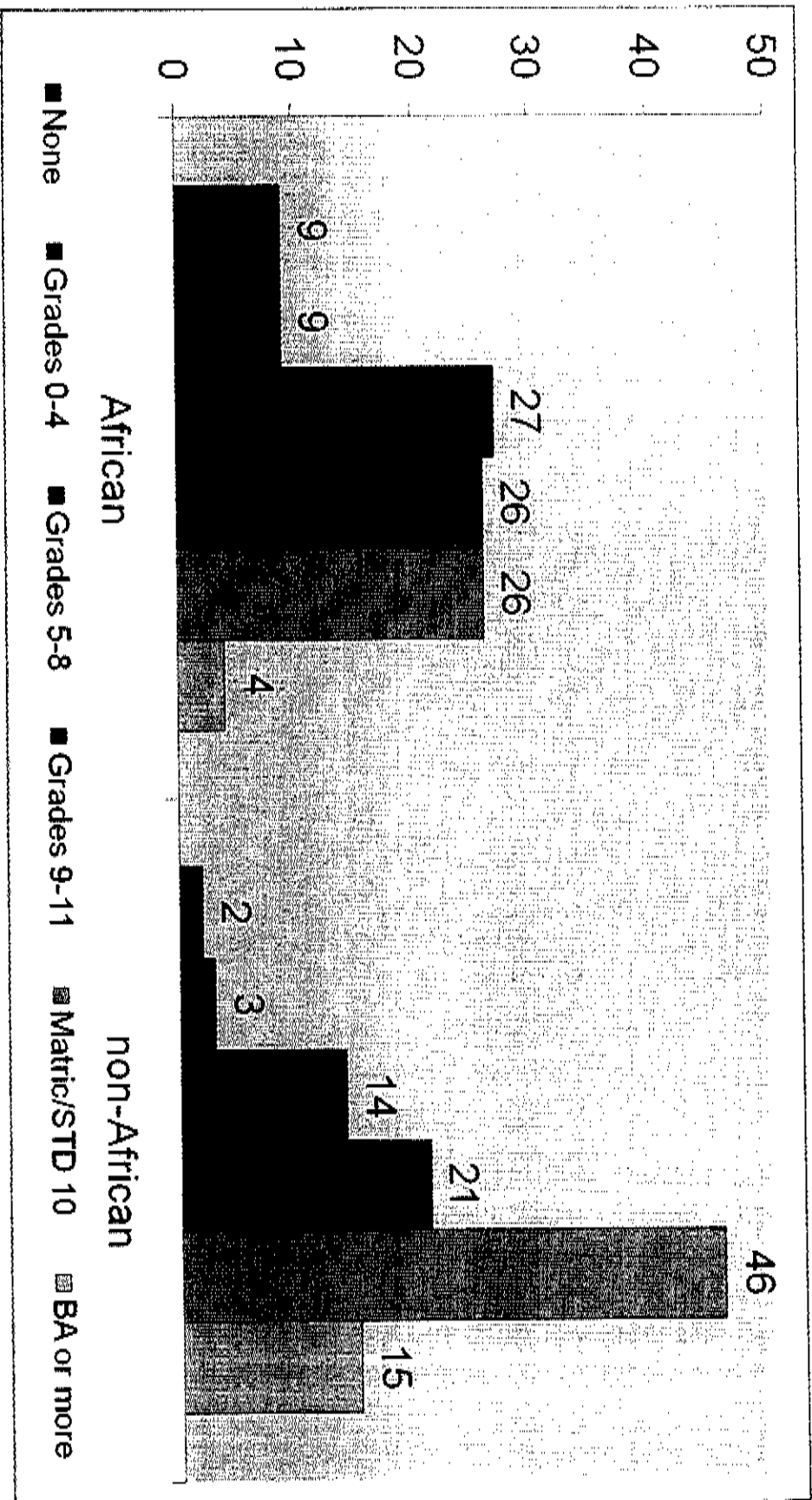
African households are **more** likely to perceive littering as a community problem but are **less** likely to recycle than non-African households.

Percent of Urban Households Recycling by Whether Littering is Seen as a Community Problem, 2003 and 2005



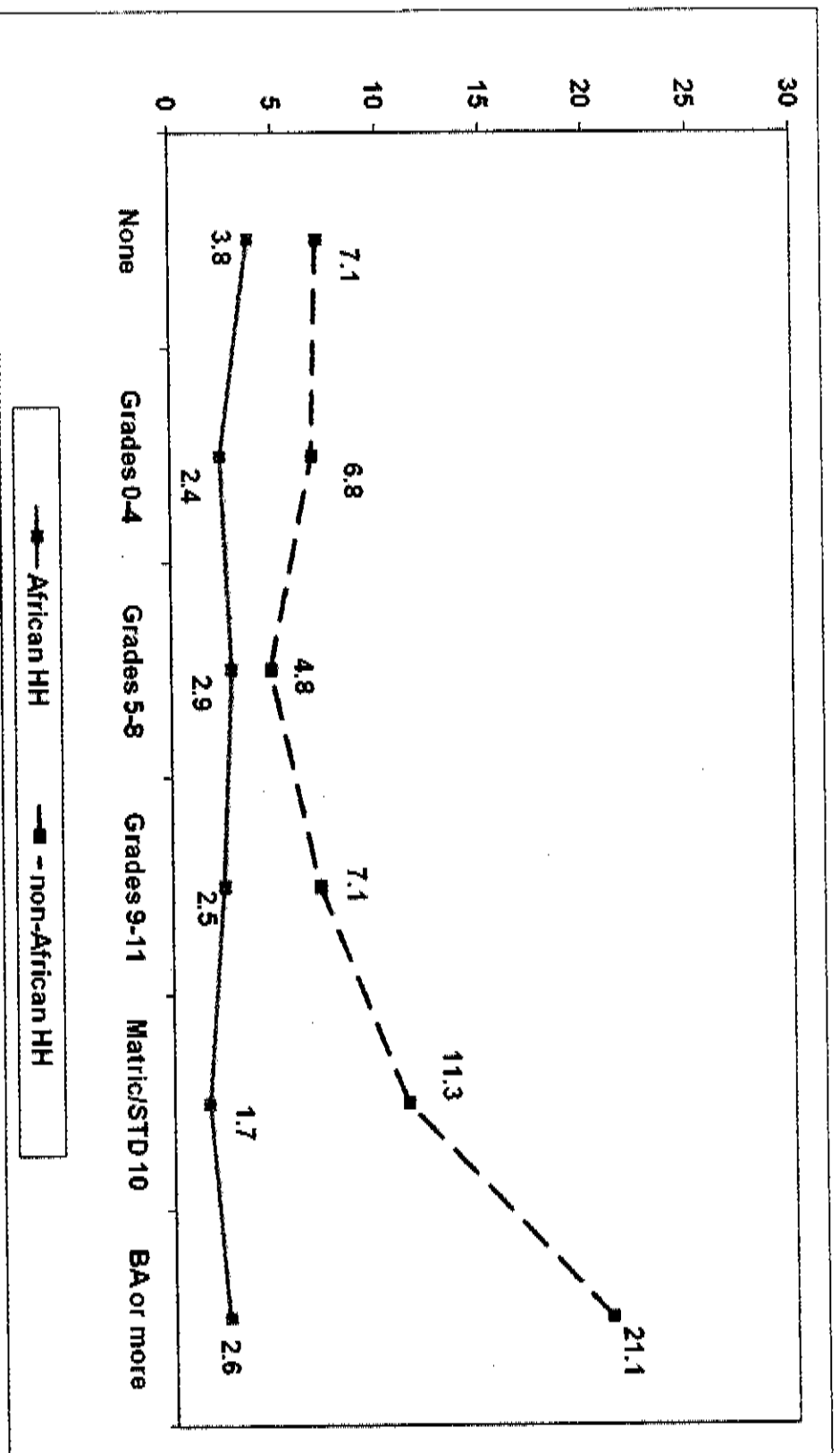
For both African and non-African households, perceiving littering as a community problem is positively related to recycling, but the level of recycling is much lower among African households.

Percent Distribution of Education of Household Head for African and non-African Urban Households, 2003 and 2005



These six educational categories yield a good distribution for both African and non-African households. Non-African average educational attainment is much higher than African average educational attainment. Matric is basically secondary school graduation.

Percent of Households Recycling by Education and African/non-African Group of Household Head, 2003 and 2005



Education is significantly **positively** related to recycling for non-African households (Spearman rho=.144**). Education is significantly **negatively** related to recycling for African households (Spearman rho=-.031**).

Variables in Multivariate Analysis

Dependent variable: HH recycles	0=Household does not recycle 1=Household recycles
Education	Education of household head. Categories in previous figure
Littering problem	0=Littering not a community problem 1=Littering a community problem
Local recycling program	0=No community/school recycling program 1=Has a community/school recycling program
Local buyback program	1=No buyback program 2=DK if there is a buyback program 3=Is a buyback program, DK distance to program 4=10+ km; 5=5km - <10km; 6=1km - <5km 7=200m - 1km; 8=100m - 199m; 9=<100m
African HH	0=Household head is not African 1=Household head is African
Dummy 2005	0=Data from 2003 survey 1=Data from 2005 survey

Explanation of Variables

- **Education of head of household** is an indicator of household socio-economic status.
- **Littering as a problem** indicates awareness of or concern with this problem.
- **Local recycling program and distance to a local buyback program** are indicators of the ease with which recycling can be carried out.
- **African HH** is a variable which indicates whether the household head is African.
- **Dummy 2005** is an indicator of whether the data were from the 2003 or the 2005 survey.

Logistic Regression of Whether a Household Recycles, 2003 and 2005

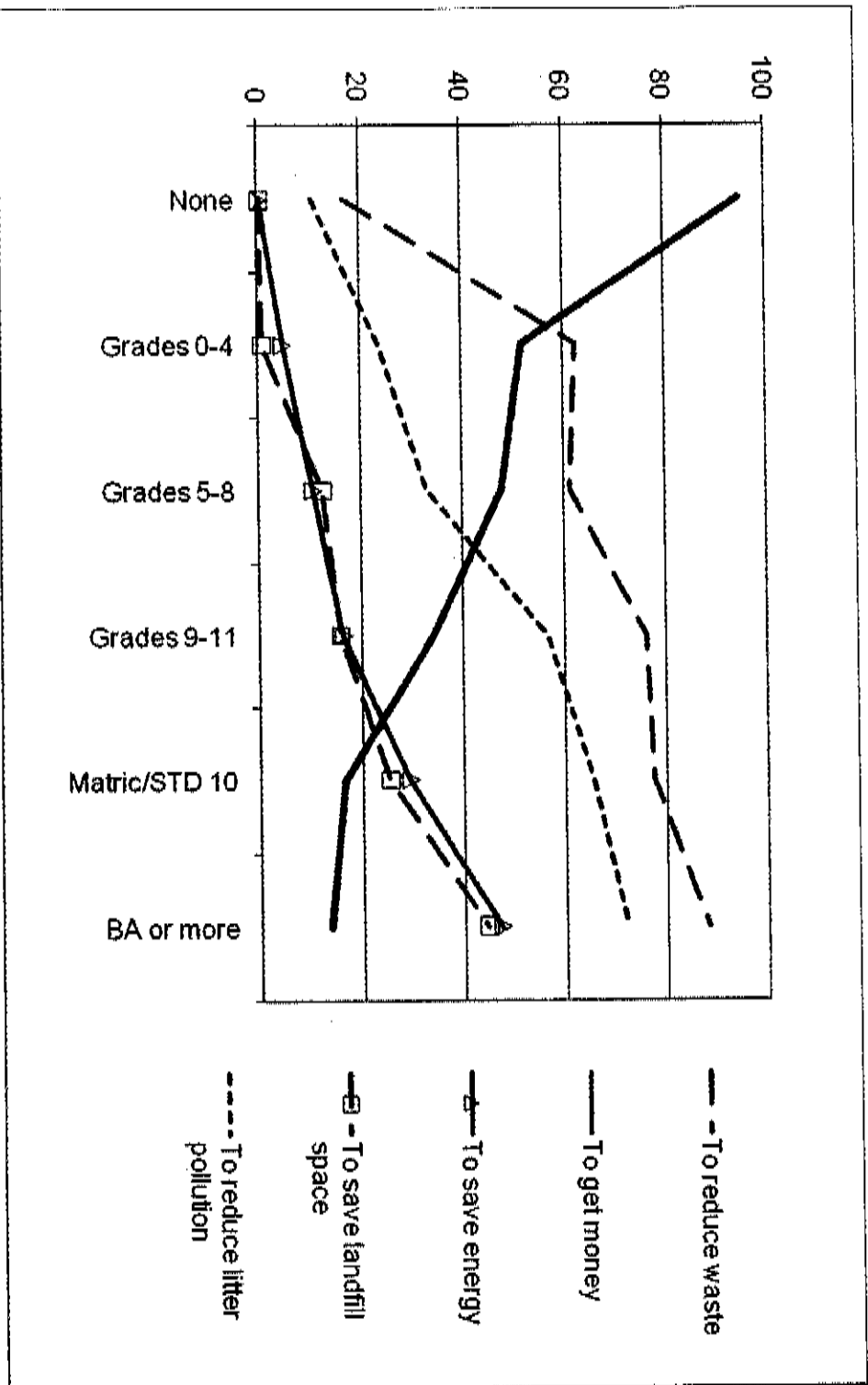
	All HH (1)	All HH (2)	Afr HH (3)	Non-Afr HH (4)
Education	.337**	.193**	-.135**	.536**
Littering a Problem	.237**	.453**	.617**	.404**
Local Recycling Program	1.782**	1.633**	1.209**	1.888**
Local Buyback Program	.245**	.241**	.277**	.239**
African HH		-1.299**		
Dummy 2005	-.240**	-.267**	-.057	-.435**
Constant	-5.521	-4.295	-4.560	-5.942
X ²	2021.2**	2442.7**	477.1**	1358.0**
d. f.	5	6	5	5
n	30,282	30,282	19,918	10,364

* p < .05, ** p < .01

Logistic Regression Results for Whether a Household Recycles

- In all results, perceiving littering as a problem is **positively** related to recycling.
- In all results, access to recycling (local recycling program and local buyback program) are **positively** related to recycling.
- As shown in equation 2, African households are significantly **less likely** to recycle than non-African households.
- In equations 3 and 4, education is significantly **negatively** related to recycling for African households and significantly **positively** related to recycling for non-African households.

Among Those Urban Households that Recycle, the Percent Giving Various Reasons for Recycling by Education of Household Head, 2003 and 2005

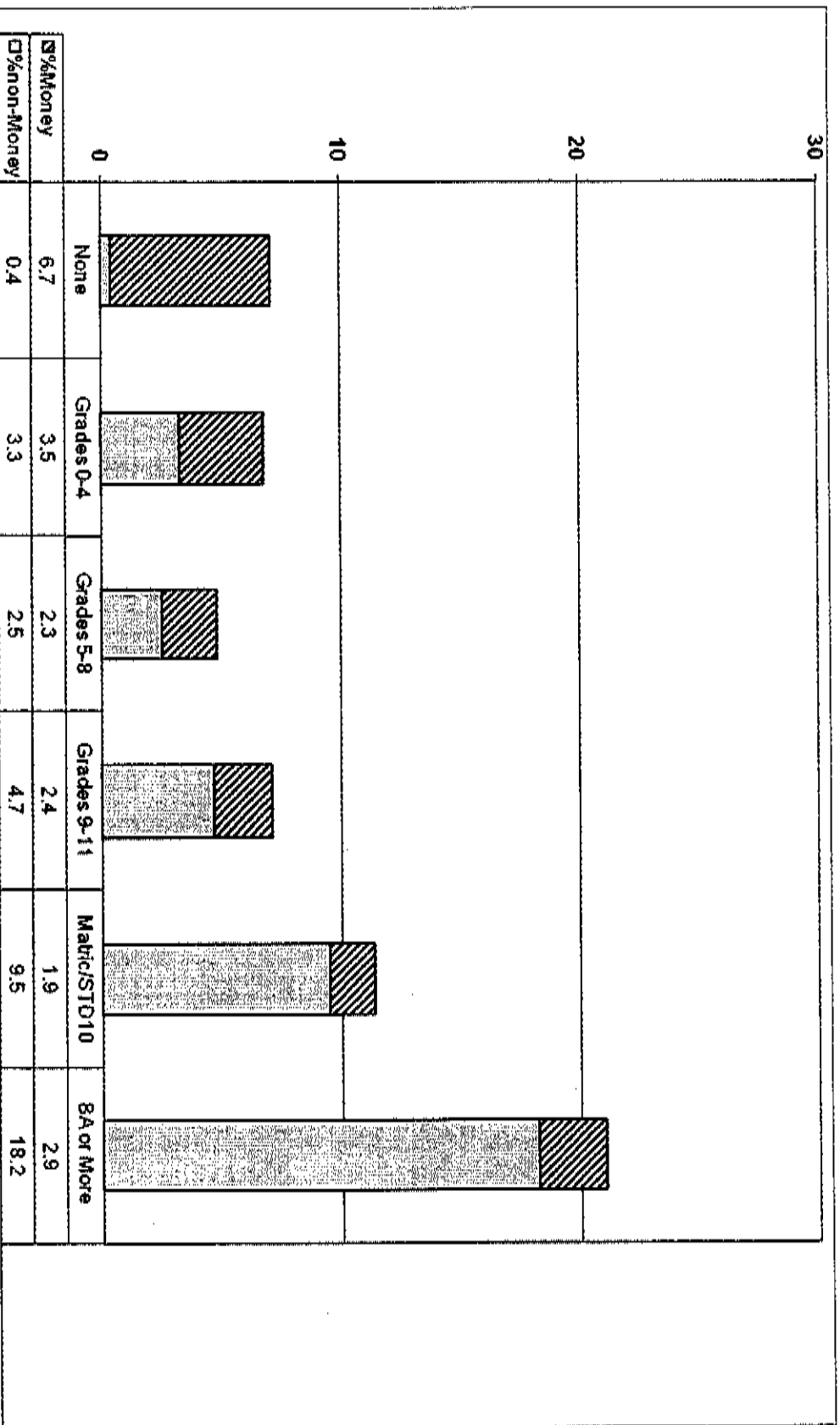


Recycling to get money **decreases** with education. Recycling for non-money reasons **increases** with education.

Recycling for Money Reasons and for non-Money Reasons

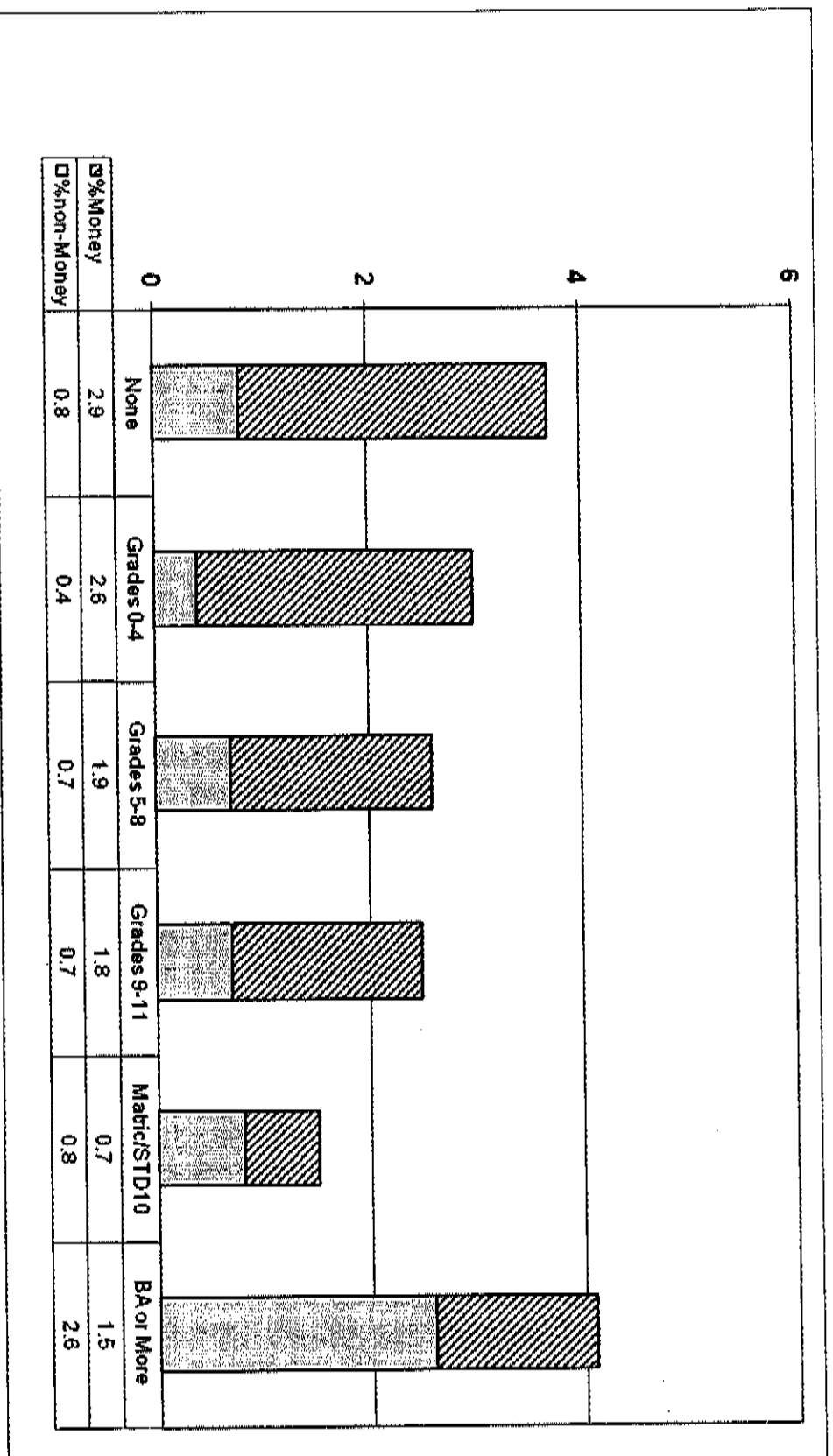
- A household that recycled was asked if it recycled for each of the reasons listed in the previous slide.
- The household did not need to agree to any reason why it recycled and could agree to more than one reason why it recycled.
- In the following slides a household is coded as recycling for **money reasons** if it agreed that it recycled to get money, regardless of whatever additional reasons it might have stated for recycling.
- A household is coded as recycling for **non-money reasons** if the household recycled but the household did **not** agree that it recycled to get money.

Percent Recycling for Money Reasons and non-Money Reasons Among all non-African Households, 2003 and 2005



Those few non-African households whose head has no education (2% of all non-African HH) are more likely to recycle for money reasons than other non-African households.

Percent Recycling for Money Reasons and non-Money Reasons Among all African Households, 2003 and 2005



Those few African households whose head has a BA or more (4% of all African HH) are more likely to recycle, especially for non-money reasons, than other African households. (Spearman Rho for educ < BA and non-money recycling = .008)

Spearman Rho Correlations for African and non-African Households Between: 1)Education of Head of Household and 2)Whether Household Recycles and Whether the Household Recycles 3)For Money Reasons and 4)For non-Money Reasons; 2003 and 2005

	Household Recycles	Household Recycles for Money Reasons	Household Recycles for non-Money Reasons
African	-.031**	-.052**	.020**
Non-African	.144**	-.014	.169**

For both African and non-African households recycling for money reasons is **negatively** related to education and recycling for non-money reasons is **positively** related to education. The positive relation of education and recycling for non-money reasons is **much stronger** for non-African households.

(*p<.05, **p<.01, two-tailed tests)

Logistic Regression of Whether a Household Recycles for non-Money Reasons and for Money Reasons, 2003 and 2005

	Recycles for non-Money Reasons		Recycles for Money Reasons	
	Afr HH (1)	Non-Afr HH (2)	Afr HH (3)	Non-Afr HH (4)
Education	.178**	.782**	-.270**	-.135*
Littering a Problem	.190	.462**	.805**	.100
Local Recycling Program	1.531**	1.951**	1.015**	1.177**
Local Buyback Program	.111**	.205**	.336**	.247**
Dummy 2005	.486**	-.266**	-.143	-.719**
Constant	-6.438	-7.468	-4.711	-4.106
X ²	106.2**	1222.1**	453.7**	211.1**
d. f.	5	5	5	5
n	19,918	10,703	19,918	10,703

- The Spearman rho and the logistic regression results for the relation between education and recycling for money reasons and for recycling for non-money reasons are similar for non-African households and for African households.
- The main difference is the stronger positive relation between education and recycling for non-money reasons for non-African households than for African households. The coefficient for education for non-African households for recycling for non-money reasons is **significantly** larger than for African households.
- The percent recycling for non-money reasons generally increases with education for non-African households. For African households the percent recycling for non-money reasons is virtually constant until a large increase for household heads with a BA degree or higher.

- An friend who is an African scholar in South Africa noted that she grew up in an urban township where many people recycled to gain a little money.
- Now, she and her husband, both of whom are highly educated professionals, do not think about recycling much.
- She said that the only time she recycles is to send paper with her son for a school paper drive.
- She noted that her son is taught in school that behaviors such as wearing a seat belt and recycling are good things to do. Her son often reminds her to fasten her seat belt, and then she does so.
- Motivated by her observations, we looked at the relation of the presence of a child in elementary or secondary school in the household to household recycling.
- We include a variable which is:
 - 0=No child in elementary or secondary school in the HH
 - 1=Child in elementary or secondary school in the HH

Logistic Regression of Whether a Household Recycles, Including Child in Household in School, 2003 and 2005

	All HH (1)	Afr HH (2)	Non-Afr HH (3)
Education	.334**	-.123**	.521**
Littering a Problem	.239**	.619**	.417**
Local Recycling Program	1.790**	1.175**	1.922**
Local Buyback Program	.245**	.279**	.239**
Child in Elem/Sec School	-.071	.333**	-.263**
Dummy 2005	-.242**	.070	-.441**
Constant	-5.479	-4.771	-5.782
X ²	2022.8**	490.2**	1370.5**
d. f.	6	6	6
n	30,282	19,918	10,364

* p < .05, ** p < .01

The presence of a child in elementary or secondary school is significantly **positively** related to recycling for African households and significantly **negatively** related to recycling for non-African households.

Logistic Regression of Whether a Household Recycles for non-Money Reasons and for Money Reasons, Including Whether Child in HH in Elem/Sec School, 2003 and 2005

	Recycles non-Money		Recycles Money	
	Afr HH (1)	Non-Afr HH (2)	Afr HH (3)	Non-Afr HH (4)
Education	.192**	.762**	-.261**	-.126*
Littering a Problem	.194	.477*	.807**	.089
Local Recycling Program	1.481**	2.003**	.989**	1.163**
Local Buyback Program	.114**	.205*	.337**	.247**
Child in Elem/Sec School	.430**	-.385**	.271*	-.145
Dummy 2005	.501**	-.272**	-.132	-.716**
Constant	-6.715	-7.250	-4.881	-4.203
X ²	113.4**	1243.2**	459.6**	212.2**
d. f.	6	6	6	6
n	19,918	10,364	19,918	10,364

- For African households, the presence of a child in elementary or secondary school is positive and significant both for recycling for non-money reasons and for money reasons, but it is much more significant for recycling for non-money reasons.
- This finding *refutes* an interpretation that having a child in school leads to more recycling by African households mainly due to a need for additional household income when there are schoolchildren in the household.
- The results are consistent with the interpretation that African households are more likely to recycle when there are school children due to the desire of African parents:
 1. To cooperate with school programs in order to help their children and
 2. To set a good example for their children.

Discussion

- The positive relation of SES and recycling among non-African households looks similar to that seen in developed countries.
- The level of recycling among African households is low and increases little with education, even for non-money reasons, until a very high level of education is reached.
- Under apartheid, there was little reason for Africans to feel much commitment to the general welfare.
- Under apartheid, collecting recyclables was important in poor townships as a means of earning money.
- It might take some time for African households to see recycling as a worthwhile activity to engage in for the common welfare.

Discussion (Continued)

- What could spur a higher level of household recycling, especially among African households in the future?
 - Fairly well-educated urban African households have only been urban and fairly well-educated for a short time.
 - Children learn about the advantages of recycling in school.
 - In a generation, this might lead to a higher level of recycling among urban Africans.
- “Wait a generation” is not a policy recommendation.
- In the meantime:
 - We know that the presence of a child in elementary or secondary school increases African household recycling.
 - We know that programs and facilities that make recycling easier increase recycling among all groups.
- More and better school education about recycling, along with more collection programs and more and better located recycling buyback centers, would likely increase recycling among all urban residents, especially among urban Africans.

Further Work

- The 2006 General Household Survey includes the required items for this analysis. We plan to incorporate the material from that data set.
- Analysis of data from 2003 and 2005 suggested a **decline** in household recycling between 2003 and 2005 among non-African households but an **increase** in recycling for non-money reasons among African households. An additional year of data would allow fuller investigation of possible time trends.
- We want to look at recycling education campaigns in South Africa, especially whether there has been any dissemination of information in African languages – 96% of Africans speak an African language at home, even if they use English or Afrikaans at work.