Chemistry Achievement and the African Caribbean Immigrant Student's Home: A Mixed-Methods and Multi-dimensional Study

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ABSTRACT

The central goal of this study was to explore the influence of the African Caribbean students' home life on their chemistry achievement. The study utilizes a mixed-methods approach and two research designs. A quantitative correlational design (using spearman rho correlational analysis), and a phenomenological qualitative design were used. For the quantitative part of the study, a questionnaire was given to 18 Baltimore high school students. Chemistry test scores were also collected. The results revealed that the students' home factors associated with parental involvement and parental encouragement influences were all significantly correlated to the students' chemistry success and these factors were also best predictors of these students' achievement. For the qualitative part of the study, seven parents were interviewed. The interview data were coded and common themes identified. Qualitative and quantitative data suggested that "parental involvement factors" significantly influenced Caribbean students' academic success. The findings of this study also revealed that 1st-generation students (22% in this study) and 2nd-generation African Caribbean immigrant students (78% in this study) are doing well academically. Important implications are discussed.

Key words: *students' chemistry achievement, African Caribbean students and parents, parental involvement, home life, voluntary and involuntary migration*

Introduction

The topic of immigrants migrating to the U.S. for a better way of life to support themselves and their families is becoming more and more a hotly debated topic. Since the November 2012 presidential elections, Republicans and Democrats have seen the need to address the immigrant issue in the U.S., as they are formulating some type of "immigration reform" bill. Although, the situation of migrants flocking to America for a better way of life is gaining attention in 2013, prior statistics will show that this topic is not a new one. Since 1965, the U.S. has admitted over 20 million new immigrants (Suarez-Orozco & Suarez-Orozco, 2000). In 2006, 13.3% of young people ages 18 to 25 years old living in the U.S. were born outside of the country and an additional 6.5% were born in the U.S. to foreign-born parents (Marcelo & Lopez, 2006). Thus, the immigrant population in 2006 accounted for about 12.1% of the entire American population. When we specifically turn our attention to the Caribbean immigrants, data

reveals that one out of every five children under the age of 18, a total of 14 million, is either an immigrant or a child of immigrant parents who have ties to the Caribbean, Africa, Asia, or Latin America (Marcelo & Lopez, 2006; Schmid, 2001; Suarez-Orozco & Suarez-Orozco, 2000, 2001).

Mitchell (2005) reports that there has been an increase in the number of Caribbean immigrants to the U.S. over the past two decades and she further points out that this rise in the numbers of Caribbean immigrants to the U.S. mirrors the trend seen with other ethno-cultural minorities in America, such as: Indians, Chinese, Africans, South, and Central Americans. Mitchell (2005) further reveals that Caribbean immigrants migrate from the 50 inhabited island countries that stretch 2000 miles from Trinidad in the southern Caribbean to Cuba (also the Bahamas) in the northern Caribbean. Caribbean people are reportedly heavily concentrated in urban areas, such as: Atlanta, Boston, Chicago, Denver, Los Angeles, Miami, New York, Philadelphia, and Washington, DC (Horner, 2001; Mitchell, 2005). Although, the aforementioned statistical data indicate that there are quite a number of Caribbean immigrants in the U.S., still the group is very rarely studied. Thus, studies are limited on Caribbean immigrants' academic and economic successes in America. Therefore, the central goal of this study was to explore the reasons for Caribbean, particularly, African Caribbean students' academic success, and to examine the possible role their home life might play on their academic achievement in chemistry.

Review of Literature

Caribbean Students, Home Life, and Academic Achievement

Although studies concerning Caribbean students' academic performance seem a bit contradictory depending on what continent or what country the report is coming from, the prevailing argument seems to be that some Caribbean immigrants to North America—Canada and the U.S. are doing very well academically, far outperforming some of their non-Caribbean peers. On the other hand, the counter prevailing argument seems to be that some Caribbean immigrants in the United Kingdom (U.K.) are underperforming in comparison to other immigrant and non-immigrant groups in the U.K.

Strand (2006, 2007, & 2008) found troubling data on Caribbean Black students' low performance on national tests in the U.K. The data findings of Strand were similar to his earlier 1998 and 1999 findings. On one hand, Strand (2006) found that Black Caribbean students scored lower than Black African students who obtained a level 4 or greater on the KS2 science examination in 2004. On the other hand, 74% of Caribbean Blacks obtained a level 4 or greater on the KS2 examination. General Certificate of Secondary Education (GCSE standardized examinations) results also showed 51.4% of Black African students achieved 5+ A to C passes in comparison to 42.7% of Caribbean Black students (Strand, 2006).

Unlike Strand's (2006, 2007, & 2008) negative U.K. findings on Caribbean immigrants' academic performance, North American findings by Pinder (2010, 2012a & b), Fisher (2005), Codjoe (2007), and Samuel, Smolska, & Warren (2001) are quite positive. Pinder (2010, 2012a & b) conducted a causal-comparative and correlational quantitative preliminary study in 2010 (this current study is an extension of Pinder's 2010 and 2012a works) with 87 African heritage high school students within Maryland; 18 of the students were Afro-Caribbean and 69 were African Americans. In her study, Pinder found that Afro-Caribbean students did significantly better in chemistry (reported statistical significance of $t = 2.43$, $p < 0.05$) than did their African American peers. Pinder also found that parental variables such as: "parents' discussion of school progress," "parents' encouragement of their child/children to take extra science lessons," and "parental motivation creating child's motivation to do science work" were factors that appeared to influence the Afro-Caribbean students' high academic success in chemistry.

Similarly, Fisher's (2005 as cited in Pinder 2012b) research findings concurred with Pinder's (2010, 2012a) findings. Fisher conducted a mixed-methods exploratory study with 26 high school students of African heritage from an urban high school in Massachusetts and found that those students who teachers identified as high achievers were all immigrants from the Caribbean (and Africa) or second-generation US citizens. She also found that they had "strong parental support" and "high academic expectations" for the future.

Codjoe (2007) examined the effects of parental involvement variables on Afro-Caribbean and African voluntary immigrants' achievement. Codjoe conducted a qualitative study with a sample of 12 high-achieving Black high school graduates. Sixty-six percent of the students were from the Caribbean and Continental Africa. Codjoe utilized individual and focus group interviews and the Afro-Caribbean and African students indicated that "parents' discussion of school progress," "parents' assistance with homework assignments," and "parental support" were factors that fueled their high academic achievement and positive attitudes toward school. The following interview data supports the aforementioned claims.

Abena [Black, voluntary immigrant] recalls her home atmosphere:

> I think my experience is a little bit different being that I was the youngest of six kids . . . All I've ever known is that you were going to go to university because when I was going into grade one, my oldest sister was going into first year of university, so I've always seen that pattern in front of me. As well, all of my aunts and uncles went to university. My whole family environment has been that of education and I've always seen it. (Codjoe, 2007, pp. 142–143)

Ama [another voluntary immigrant] recalls her father as being "very pro-education" when she was young (Codjoe, 2007, p. 143). Ama recalled that her father would let her play:

> . . . but usually he would have a rule that every week [I'd] have to summarize a little story [I] read for [him]. I hated it then, 'cause I couldn't go outside and play.' At least that instilled that love for reading, for education. Going to school was a good thing, it was a fun thing. I hated being sick, every time I was sick, I would pretend I wasn't sick so that I would go [to school], just so I wouldn't miss anything. (Codjoe, 2007, p. 143)

Kofi, another voluntary minority recalls:

> When we were younger our mother did sit us down a lot of times and taught us simple math, how to write. We all knew how to write before we were able to formally enter school. Our mother took the time to teach us. It came to a time when we were sort of fooling around in school, and I recall an incident where my father took away our TV
> privileges and he would lock us in our room every night to study. We got the understanding that we had to take certain things very seriously. (Codjoe, 2007, p. 143)

Moreover, the student narratives presented explicit evidence that overall parental involvement in their school work influenced their high-achieving status (Codjoe, 2007).

Samuel et al. (2001) present similar findings to that of Codjoe (2007) in their mixed-methods study of voluntary immigrants to North America. Samuel et al. found that voluntary immigrant students in their study (which included 223 Caribbean immigrants, 11% in their study) fared better academically than some of their native peers. Samuel et al. found that most of the immigrant students' academic performances were influenced by their parents' and community's positive attitudes and commitment to school, and the students felt that their parents took a real interest in their school work (i.e. they were involved in their schooling).

Theory to Explain the Academic Success of Some African Caribbean Students in North America

Ogbu (2003) argued that cultural-ecological theory effectively accounted for why members of a minority group do or do not do well in school. Cultural-ecological theory of minority schooling takes into account the historical, economic, social, and cultural aspects of the Black minority groups in the larger society in which they exist. Cultural-ecological theory considers and compares the two ways of becoming minorities and their educational implications in the USA, namely, immigration and non-immigration (Ogbu, 2003). Additionally, descendants or later generations of voluntary minorities are voluntary minorities like their foreign born parents or grandparents. Thus, second-, third- and fourth-generation immigrants are also considered voluntary minorities. It does not matter that it was their forebears rather than themselves who decided to migrate to America, the community forces that developed among their forebears may continue to influence their educational ideas, attitudes, and behaviors (Ogbu, 2003).

Further, it is believed that some voluntary immigrants compared to some involuntary immigrants may have different beliefs about the instrumental value of school credentials. Some immigrant voluntary minorities might believe more strongly that the way to get ahead or to achieve upward mobility or "the American dream" is to get a good education and good credentials. To some of them, education may be seen as the key to success. They may believe that education can help them to succeed more in the U.S. than in their "native" home. On the other hand, it is believed that some involuntary immigrants may be unsure that education is the key to success. Some involuntary immigrant students may see little evidence of academic success or upward social mobility among their own peers (Gibson & Ogbu, 1991; Ogbu, 2003).

Proponents of the cultural-ecological theory further postulated that cultural values, attitudes, norms, and traditions present in a student's home may influence his or her school value or attitudes toward learning in general. Ogbu (2003) highlighted two community forces that he believed attributed to poor achievement among some Blacks. The community forces outlined by Ogbu were: (a) student-centered factors, such as: low ability, negative peer pressures, and the belief that academic success is "acting White," and (b) lack of parent-centered factors, such as: ***lack of parental involvement in their child's education***, low expectation of Black students, and high expectations of White students.

Research Questions

This study consisted of four research questions: three central and one sub-question. Thus, this study sought to answer two central quantitative research questions and one central qualitative research question. One quantitative sub-question was also addressed. The questions were:

1. What was the tabulated mean score of the African Caribbean students on their test of science achievement? How might this score compare with non-Caribbean students who also took the same science test?(Central Quantitative Question)
2. Are there correlations between the African Caribbean students' home factors and chemistry achievement? (Central Quantitative Question)
3. What are the perceptions of African Caribbean parents in respect to home life factors influencing their children's academic achievement? (Central Qualitative Question)
4. What was the emerged profile of the African Caribbean grouping and household that came about after conducting the quantitative portion of the study? (quantitative sub-question)

Methods

Research Designs and Instruments

The study utilized a mixed-methods approach and two research designs. A quantitative correlational design and a phenomenological qualitative design were used.

A correlational design seeks to see if one variable (or factor) might be influencing another, so basically this study sought to find out which of the home life factors influenced the African Caribbean students' achievement. A phenomenological study is a study that attempts to understand people's perceptions, perspectives, and understandings of a particular situation (Leedy & Ormrod, 2013). For example, in this study the researcher sought to understand (African Caribbean) parents' views/perceptions of the influence of home life factors on their children's/students' achievement.

For the quantitative part of the study, a teacher designed chemistry test and a student background questionnaire (Organization for Economic Co-operation and Development, Program for International Student Assessment questionnaire, i.e. OECD PISA questionnaire) were given to the students for completion. The questionnaire was designed to collect information on students' gender, age, grade level, and country of origin of them and their parents. The majority of the questions pertained to the home environment and family life of the child/student and the questions were centered on the level of parental involvement, family composition, parental education, and children's after school activities. The PISA questionnaire was selected for this study because it had been widely used in about 50 countries and had underwent rigorous field testing before its final use. The questionnaire consisted of 31 items and consisted primarily of likert-type questions in which strongly agreed responses equaled 4, agreed responses equaled 3, disagreed responses equaled 2, and strongly disagreed responses equaled 1. For the test of science measure, it consisted of materials which covered periodicity, reaction rates, acid/base/ph scales, and basic chemistry calculations with respect to gas laws, molar mass, and temperature scales. For the qualitative part of the study, telephone interviews and online "interview protocol sheets" were used.

Sample Sizes, Study Sites, and Procedures

For the quantitative part of this study, 18 African Caribbean students of an urban high school in Baltimore City, Maryland served as participants. The students were all taking chemistry in the spring of 2009 and were all grade 12 students between the ages of 17 and 20. The students were taken from a larger sample of minority students that were a part of a federal research grant project conducted by the primary researcher's university (which was a university in Central Maryland) between 2007 and 2010. In respects to data collection, data was collected between March 16 and May 28, 2009. A student background questionnaire was given to the students during their class time. The students were given 50 minutes to complete the questionnaire and the primary researcher remained in the classroom during the 50 minutes time period of questionnaire completion to answer any questions students had and the researcher collected the completed questionnaire from each participant, this ensured maximum questionnaire return.

For the qualitative part of the study, seven parents representing primarily an urban district in Baltimore City, Maryland participated in this study. The parents were primarily voluntary Caribbean immigrants to the U.S., except one participant. All of the

parents were of middle socio-economic standing (i.e. what is considered middle class standing in the U.S.). The parents selected for the interview were selected through convenience sampling as those selected were primarily graduates or soon to be graduates of the primary researcher's former university (which is located in Central Maryland). The parents were interviewed by telephone and via the internet, those interviewing by the internet were allowed to complete an "interview protocol sheet." The parents were interviewed between February 15th and February 26th, 2013. A semi-structured interview format was used. Four areas of interest were investigated during the interview. The areas of investigation were: provision of (or lack thereof) quality parental involvement time towards discussion of homework/discussion of school progress with child/with teacher; the provision of (or lack thereof) encouragement/motivation to child(ren) to excel in school; number of hours spent assisting child(ren) with homework assignments; and encouragement (or lack thereof) of child(ren) to take extra science classes.

There was a listing of field questions which was used to derived answers to the central qualitative question, which was: "What are the perceptions of African Caribbean parents in respect to home life factors influencing their children's academic achievement?" The list of field questions were: (1) *which three of the following home/parental factors do you think are critical in influencing children's (students') academic success? (Explain why you selected the choices you did). Select from: (a) home educational resources (e.g. books, computers, etc.), (b) parents' level of education (Ph.D. vs. M.S. vs. B.S. vs. high school diploma), (c) parents' discussion of school progress with the child (parental involvement factor), (d) parents' assisting their child/children with their homework assignments (parental involvement factor), (e) parental motivation towards learning transferred to children's motivation to learn, and (f) parents' encouragement of their child/children to participate in extra after school classes. (2) Do you think provision of quality parental involvement time in respect to you discussing homework with your child, or you discussing school progress with your child, do you regard the aforementioned as being critical to your child's academic success? Explain. (3) Do you think parental encouragement or parental motivation to acquire and seek knowledge = child's motivation to acquire and seek knowledge and is it a winning formula in respect to children/students academically succeeding? Explain. (4)How many hours a week would you spend assisting your child with his/her homework? Explain in hours. (5)Encouraging/urging children to take extra classes to improve upon their class grades, do you think this is important as a parent? Explain.*

After conducting the interview, the collected interview data were coded and some examples of the codes that were used to sort through the interview data were: "parental involvement = projected child/student's academic success," "parental motivation/encouragement to acquire knowledge ≠ child's motivation to acquire knowledge," "provision of some adequate amount of hours for homework assistance is needed," and "extra classes may help." The codes mentioned beforehand were used to identify common themes in the collected data.

Data Analyses

The analyses consisted of four primary components. First, descriptive statistics were obtained as means and standard deviations were determined for each groups' science achievement variable (Table 1). Second, bivariate relationships between the variables of home life factors and science achievement were examined using Spearman correlation test (Table 2). Third, a phenomenological, semi-structured interview approach was used to capture parents' views on home life influencing their child's/children's achievement. Fourth, an examination of collected data from the students' background questionnaire responses was performed to determine what the African Caribbean grouping looked like (Table 3).

Results

Quantitative Findings

Achievement. The first question in this study sought to determine/tabulate the mean score of African Caribbean students on their test of science measure. Mean scores were also compared for African Caribbeans and non-African Caribbeans. Table 1 shows the mean score of African Caribbean students in chemistry, which was M = 87.39 (SD = 6.58) out of a possible 100 points; whereas, the mean score in chemistry for the non-African Caribbean students who also took the same high school chemistry test was slightly lower at 81.36 (SD = 9.95) out of a possible 100 points.

Table 1
Means and standard deviation values for science achievement of African Caribbean and non-African Caribbean students

	African-Caribbean n=18		**non-African Caribbean** n= 69	
Achievement	M	SD	M	SD
Chemistry test score	87.39	6.58	81.36	9.95

Note: M=Mean score; SD = standard deviation

Home Life Factors Influencing Chemistry Performance

The second question in the current research sought to determine if there were correlations between African Caribbean students' chemistry test score and their home life factors. Table 2 presents data which shows that there were significant correlations between several home life factors and chemistry achievement. The home life factors that significantly correlated with students' chemistry achievement were: "parents discuss school progress ($r = 0.54$, $p < 0.05$)," "time spent in extra science lessons ($r = 0.50$, $p < 0.05$)," and "performance motivation to do science ($r = 0.66$, $p < 0.01$)."

Table 2
Relationships between chemistry achievement and home life factors for African-Caribbean students

	African-Caribbean n=18
Chemistry test score	**87.39%**
Family background factors	**r values**
Parents' education	-0.04
Parents discuss school progress (P.I.)	0.54*****
Parent assist with H.W. (P.I.)	0.04
Home educational resources (computer, calculator)	0.26
Number of books in home	0.32
Extra science lessons	0.50*****
Performance motivation (science)	0.66******

Note: P.I = parental involvement factor, H. W. = homework, r = correlation to achievement, ***** $p < 0.05$, ****** $p < 0.01$

Qualitative Findings

The third question of the study, which was a qualitative question sought to identify or to uncover African Caribbean parents' perceptions of home life influencing their children's academic success/achievement. The following interview data reveals parental thoughts on the issue.

Primarily African Caribbean parents had an opportunity to express their view points on home life/parental influences on their child/children's academic success. One hundred percent of those parents interviewed mentioned that parental involvement = child's/student's academic success. Parents interviewed felt that assisting their child/children with homework and discussing school progress with them were pivotal to them doing well in school. The following excerpts demonstrated the African Caribbean parents' thoughts on the benefits of "parental involvement" to their child/children's academic success.

Willie [Parent 1] stated:

> Educational resources in the home coupled with solid parental involvement, regardless of parents' academic level are more influential. Students typically feed off parental involvement/attitude than any other factor.

Eda [Parent 2] stated:

> Parents play a major role in the academic success of the child. I would suggest as much as 90%. Although it takes all three: the child, the school and the parent, it is clear the parent wields the most power in this triad. Schools will step up the curriculum once the parents intervene. Children will step up in the homework, when they receive assistance and parents make it a priority. It has to be a priority with the parents . . . Parents with college degrees will know the benefits of higher education and want their children to achieve academic success. They also know that career choices are more abundant when their children are academically

> prepared . . . When parents assist their children with their homework or make sure they have appropriate tutors, they are sending the message to their children that they care about their success both personally and academically.

Dale [Parent 3] stated:

> I think a highly educated parent will be more able to not only assist their children with sophisticated academic projects and assignments, but would also be more informed about the needs and challenges of a student. With this information handy, their children would always have someone to look up to in the absence of the teacher. Parents help or support children [to] set important academic goals in life. A person with little or no education at all would not be in a position to assist his/her children as much as a highly educated parent would . . . Yes, I believe that parental involvement in terms of working on homework with the kids is crucial to a child's academic success. If the children can obtain the information that they need in the absence of the teacher, then the flow of knowledge goes uninterrupted and so does academic success.

Mindy [Parent 4] stated:

> Discussing homework/school progress with your child is critical to their academic success. Parental involvement leads to higher standards and increased achievement. It also fosters the development of responsible, respectful, self-directed life-long learners in the future for the child[ren]. The expectations of parental involvement culture a better community at home and in school.

Dee [Parent 5] stated:

> Yes, it is important. Parents need to discuss homework with their children. We need to encourage our children to do homework every day. We also need to know what they did in school so we can know their progress.

Pam [Parent 6] stated:

> It makes children stay focused with school work if parents are involved.

John [Parent 7] stated:

> Parental involvement factor—homework assistance by parents and regularly checking on children's progress in school by discussing and asking questions related to school work is important because it shows the child how much interested you [the parent] are and how much you [the parent] value education.

Fifty–seven percent of those interviewed believed that "parental motivation to acquire knowledge ≠ child's motivation to acquire knowledge." Parents felt that parental

encouragement or parental motivation do not always translate into children's motivation to learn. The following interview data present parents' views:

Willie [Parent 1] stated:

> Not necessarily . . . whereas parental encouragement and motivation are good, they do not represent the silver bullet without active parental involvement and providing a home environment with the resources and stimulation.

Eda [Parent 2] stated:

> Parental motivation cannot predict a child's motivation for academic success. The most successful parents in the world can have a child that is just not interested in school. There are numerous academic scholars who simply struggle to get their children out of high school. They will have some that are academically inclined but may have one or two that simply want to leave school as soon as possible.

Dale [Parent 3] stated:

> Not necessarily so, but usually is the case especially if the child is as motivated as the parents in terms of the child's academic success. However, if the child is struggling in terms of academic success and motivation, the efforts from the parents will likely translate into failure.

Dee [Parent 5] stated:

> It does not equal to child's motivation because parental motivation cannot translate to student's success. However, it can help to some degree because when you motivate and encourage a child[,] he/she will want to do well academically.

Although, some of the parents interviewed could not reach a definitive conclusion with respect to the amount of time they should spend assisting their child/children with their homework assignments, they were in agreement that some time should be spend assisting. Thus, one hundred percent of interviewees thought that some adequate amount of homework assistance time was needed. The following excerpts represent parents' views:

Willie [Parent 1] stated:

> It is impossible to provide an absolute in terms of hours . . . suffice it to say the number of hours per week will be determined primarily by the needs of my child.

Eda [Parent 2] stated:

> The amount of time you spend as a parent assisting your child with homework depends on the child. If your child is strong academically you may only need to spend an hour or two a week discussing upcoming major projects. If however your child struggles academically, eight to ten hours a week may be needed to cover all subjects.

Dale [Parent 3] stated:

> As many as needed, but I would try as much as possible to be the overseer waiting for the child to take charge of the whole game. Likely, 3 hours a day and about 15 hours a week.

Mindy [Parent 4] stated:

> I would say about 12-16 hours per week. Also, I think the amount of time depends on the child age and learning ability. These days the parent has to get involved, the teachers can't do it all at school. The learning process goes on.

Dee [Parent 5] stated:

> 5 hours a week are good enough. At least 1 hour every day, Monday through Friday. One hour is enough given that the child had an entire[ly] busy school day and she/he need to play too.

Pam [Parent 6] stated:

> . . . it depends on the subject, may [be] an hour or so . . .

John [Parent 7] stated:

> . . . At least 10 hours and more when special projects are given or as the situation warrants.

Besides assessing parental perspectives in regard to "parental involvement = projected student's/child's academic success," "parental motivation to acquire knowledge = or ≠ child's motivation to acquire knowledge," and "hours spent assisting child with homework per week," parents were also asked about their views on the importance of children/students taking extra classes to improve upon their grades. Those interviewed felt that the need for a child to take extra classes should be stressed if the child is not doing well. So if a child/student is failing, then the child should be encouraged to take extra classes to improve his/her grade. Seventy-one percent of the parents interviewed shared this sentiment:

Willie [Parent 1] stated:

> If the child is in need of extra classes [,] I would definitely encourage/urge participation as added reinforcement and time on task may lead to improved grades.

Eda [Parent 2] stated:

> If a child needs to take remedial classes to improve skills, it is an absolute necessity. However, extra classes to improve may take time away from studying the basic subjects they need to graduate.

Dale [Parent 3] stated:

> For me, that is not an idea I would present to my children, but rather try making them succeed with whatever classes they are taking at the time. The extra classes would only be provided as an alternative only.

Pam [Parent 6] stated:

> . . . it depends on the children's level of understanding, it may be necessary for some children to take extra classes [,] if their performance is average or below average.

John [Parent 7] stated:

> Not necessarily because I would not want to over load my child with extra classes when and if the regular school work is rigorous enough. If the school work is not enough in terms of rigor and quantity, then I will encourage the child to take extra classes especially online or on weekends.

The interview data suggested that "discussing school progress with children" and "the amount of hours spent assisting children with homework" (all parental involvement factors) can be pivotal to children's/students' academic success. However, parents interviewed felt that "parental encouragement" and "parental motivation to seek knowledge" do not always translate into "children's motivation to acquire knowledge." Parents also felt that extra classes should be encouraged only if needed.

The fourth research question sought to find out what the African Caribbean grouping looked like (inclusive of household components; data were all drawn from the students' responses on their completed background questionnaire). Basically, after conducting the quantitative part of this study and examining the completed students' background questionnaires, what was the emerged profile of the African Caribbean grouping? Table 3 shows that 56% of the African Caribbean household had a mother and father present, households were somewhat crowded with 5 people on average living in a house. Additionally, 72% of the students planned on attending and graduating college. Moreover, of those students who completed the student background questionnaire and test scores were collected on them, it was found that 14 out of 18

(78%) were born in the U.S.A. to first-generation Caribbean immigrants and so were regarded as second-generation Caribbean immigrants, and 4 out of 18 (22%) of the students were born in the Caribbean and migrated to the USA (so were first-generation Caribbean immigrants).

Table 3
A Profile of the African Caribbean Group

	African Caribbean Grouping
Mother and Father Present in Household	56%
Crowded Household	5 people on average
14 out of 18 students born in the USA (*2nd generation Caribbean immigrants)*	78%
4 out of 18 students born in the Caribbean (1st generation Caribbean immigrants)	22%
Students plan to graduate college	72%

Discussion

African Caribbean students appeared to outperform non-African Caribbean students on their chemistry achievement test. African Caribbean students' mean score was 87.39 and the non-African Caribbean students' mean score was 81.36, which meant that the African Caribbean students scored 6.03 points higher than their non-African Caribbean peers. Additionally, quantitative correlation data suggest that "parents discussion of school progress (parental involvement factor)," parents encouragement of child to take "extra science classes," and parental motivation encouraging/influencing child/children's "performance motivation to do science," were factors that influenced the African Caribbean students' chemistry achievement.

On one hand, qualitative findings seem to support quantitative findings in this study; in that, African Caribbean parents interviewed felt that parental involvement in children's schooling (be it assisting with school homework or discussing school progress) was important to the child's academic success. The aforementioned findings align with Codjoe (2007), Fisher (2005), and Samuel et al. (2001) who also found parental involvement to be critical to a child's academic success. On the other hand, some of the qualitative findings are not align with quantitative findings; in that, quantitative data suggest "extra science lessons," and "performance motivation to do science" influence science achievement, qualitative findings suggest they do not. Fifty–seven percent of those African Caribbean parents interviewed did not think "performance motivation" was critical to a child's academic success, and seventy-one percent of them felt that "extra classes" were not all that important and should not be encouraged by parents, unless there was an important need for it—child/student failing his/her class was given as an example.

Moreover, the findings of this study suggest that first and second-generation African Caribbean students are doing well academically and are outperforming some of their non-African Caribbean peers. There is the belief that the first-generation Caribbean immigrants' (the parents of the 2nd generation Caribbean students in this study) positive

views of the U.S. educational system and academic success may be influencing their children's views of school and hence the reason for these students' academic success. This finding is consistent with the extant literature reports of Ogbu (2003), Ogbu & Simons (1998), and Samuel et al. (2001) who also found that some Caribbean students to North America outperformed some of their non-Caribbean peers and it was believed that parental/home influence was the primary cause for such performance.

Limitations of the Study

The present study had several limitations which may affect the interpretation of the results. For the qualitative and quantitative parts of the study, only a small sample of students and parents chose to participate. Also, a convenience sampling of participants was employed instead of a true random sampling technique (quantitative part of study). Thus, because of the limitations mentioned beforehand, the findings of this study may not be generalized to a larger population of Caribbean parents and students.

Conclusion and Recommendations for Future Research Study

Cultural-ecological theory suggests that the differences in the patterns of arrival of immigrants to the USA may greatly influence their patterns of achievement (Ogbu, 2003). For instance, voluntary immigrants (African Caribbeans), it is believed chose to migrate to the U.S., therefore, it is felt that their views and attitudes toward learning would be different from those non-voluntary immigrants (e.g. African Americans, etc.) whose ancestors did not choose to migrate to the USA, but were brought by force (Ogbu & Simons, 1998; Ogbu, 2003). Ogbu & Simons (1998) postulated that an immigrant who chose to migrate would do better academically than an immigrant who did not choose to migrate. Cultural-ecological theory also suggests that differences in parent-centered home factors may influence differences in achievement patterns between immigrant groups (Ogbu, 2003). Thus, both of the explanations might account for why some African Caribbean students do well in America (see Pinder, 2010).

The quantitative data findings of this study revealed that 78% of those African Caribbean students sampled were second-generation Caribbean immigrants, being born in the U.S. to foreign born parents; whereas, 22% were first-generation Caribbean immigrants (Table 3). The aforementioned data along with the interviewed seven parents' positive outlook on their children's academic success suggest that whatever positive impacts arrival to America had on the first-generation of Caribbean immigrants (the parents), it is likely impacting their children's academic success/achievement in America (the second-generation Caribbean students).

This study was an exploratory one which utilized a mixed-methods approach to determine if home factors influenced African Caribbean students' science achievement. A purely qualitative study may be conducted as a follow up to this study. Researchers may better understand the parent, teacher, student, home, and school dynamics through dialogic interactions with parents, students, and teachers.

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