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Who Plays the Georgia Lottery?

Results of a Statewide Survey

by Joseph McCrary and Thomas J. Pavlak

Carl Vinson Institute of Government
The University of Georgia

Public Policy Research Series

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Richard W. Campbell, ***Series Editor***

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Who Plays the Georgia Lottery? Results of a Statewide Survey

Foreword

Surveys of public opinion consistently have shown support for state lotteries, particularly when lottery revenues target education as the primary beneficiary of lottery revenues. There has been considerable debate, however, regarding the distribution of costs and benefits of state lotteries: who plays versus who benefits. Little empirical research has tied together attitudes toward lotteries, lottery play, and receipt of benefits from lottery-funded programs.

This paper, *Who Plays the Georgia Lottery: Results of a Statewide Survey*, is an outgrowth of a study of the economic impacts of the Georgia Lottery conducted by the Vinson Institute for the Georgia General Assembly. As part of that work, the Institute conducted a telephone survey of a representative sample of Georgia's population in the fall of 2000 to examine the public's attitudes toward the Georgia Lottery, rates of lottery play, and the distribution of benefits from lottery-funded programs. The survey data indicate the following: Georgians overwhelmingly support the lottery (primarily because of the funding it provides for education); lottery play tends to be regressive; less-educated and black lottery players were more likely to be active players and to play games with more frequent draws; spending on prekindergarten programs benefits blacks and lottery players more so than nonblacks and those who do not play the lottery; and black respondents and those with less education were less likely to have someone in their households who had received a Hope Scholarship.

The authors of the paper are Joseph McCrary, who served as project manager of the Georgia Lottery Study while a research associate at the Vinson Institute, and Thomas J. Pavlak, director of the Vinson Institute's Research and Policy Analysis Division.

The Vinson Institute's Public Policy Research Series presents the results of objective and systematic research on complex policy issues facing the state of Georgia and its local governments. Given the growing interest in state lotteries among Georgia's neighboring states and the increasing demands on the Georgia Lottery Fund for support of HOPE scholarships and other educational programs, there doubtless will continue to be debates over the regressivity of lottery play and the distribution of lottery benefits. We are pleased, with the publication of this paper, to be able to contribute to public discussion on these important issues.

James L. Ledbetter
Director, Carl Vinson Institute of Government

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Executive Summary

The Carl Vinson Institute of Government recently completed a research project for the Georgia General Assembly analyzing the economic impacts of the Georgia Lottery. As part of that study, a telephone survey of a statistically random and representative sample of Georgia's population (803 respondents) was conducted in the fall of 2000. In addition to ascertaining how Georgians feel about the lottery, the purpose of the survey was to determine who actually plays the lottery and who benefits from lottery-funded programs. This paper presents the major findings of this research and identifies for state policymakers several steps that can be taken to reduce the regressive effects of lottery-funded programs.

The survey results show overwhelming support for the Georgia Lottery, with 77.9 percent of respondents indicating that they would vote in a referendum to continue the lottery. The data also demonstrate that the public supports the lottery largely because lottery revenues are earmarked for educational programs. More than two-thirds of respondents (68 percent) indicated that they would not vote to continue the lottery if it did not fund educational programs. Although older respondents and respondents who were classified as nonplayers were somewhat less likely to express support for the lottery (67 percent and 58 percent, respectively), there were no real differences in attitudes toward the lottery based on race, gender, age, income, education, or type of player—support for the lottery was strong in all six categories (see Figure 1).

More than two-thirds of respondents (68 percent) indicated that they would not vote to continue the lottery if it did not fund educational programs.

Research has demonstrated that lotteries are regressive—citizens with less income tend to spend a greater percentage of their income on lottery products than do higher-income citizens. Previous research also suggests that players from lower-income households are more likely to purchase tickets and that they tend to purchase tickets with greater frequency. We found in our research that the rate of play across income categories is relatively consistent (ranging from 52.8 percent to 62.9 percent), indicating that income is not related to whether an individual has purchased a lottery ticket in the past year. However, our data do establish a relationship between income and the types of games played—lower-income persons are more likely than higher-income persons to play lottery games that are drawn more frequently. Of the six games offered by the Georgia Lottery, only instant games and Pick 3 (both with daily draws) are statistically associated with income. While the rate of play is higher in instant games (31 percent of respondents report playing the game) than in Pick 3/Pick 4 (15.7 percent), the likelihood that a respondent plays these

games decreases as income increases. There does not appear to be any statistical relationship between income and the play of Lotto and Big Game (both of which have several draws weekly).

Our research generally supports the findings of earlier studies that lottery play is related to education and race. In Georgia, respondents with more education, especially those with postgraduate education, were least likely to have purchased a lottery ticket in the past year. Respondents with less education are significantly more likely to play games with more frequent draws (e.g., instant games, Pick 3/Pick 4). For each game, as education increased beyond "some college," the percentage of respondents reporting they had purchased a ticket in the past year decreased significantly (see Figure 3).

Whereas previous research suggests that lottery play is heaviest among blacks, our survey results show that there is no difference among blacks, whites, and those of other races. We do find, however, that the play of specific games does vary by race. In Georgia, blacks are much more likely to have played Instant Games, Pick 3/Pick 4, Fantasy 4, and Keno than are players in other racial categories (see Figure 4).

This study also tried to gauge the intensity of lottery play, classifying respondents as nonplayers, casual players, and active players, and found that the intensity of play also varies by race and education. Nearly half (49 percent) of respondents were classified as nonplayers; that is, they had not purchased a lottery ticket in the previous year. Forty-three percent of respondents were classified as casual players, having purchased lottery tickets either several times a year or monthly and spent an average of less than $10 per week on lottery tickets. Only 8 percent of respondents were classified as active players; they reported spending more than $10 per week on lottery tickets and played the lottery at least once per week.

Nearly half (49 percent) of respondents were classified as nonplayers; that is, they had not purchased a lottery ticket in the previous year.

A logistic regression analysis found that blacks, males, and those who had not finished high school or those with a high school diploma or GED are more likely to be active lottery players than are nonblacks, females, and those who have an education above the high school level. Holding the other explanatory variables constant, we found the following:

- Blacks are three times more likely than nonblacks to be active lottery players.
- Males are almost four times as likely as females to be active lottery players.
- An individual without a high school degree or GED is more than four times as likely to be an active lottery player as an individual who has an education above the high school level.

- A high school graduate is two and a half times more likely than someone who has an education above the high school level to be an active lottery player.

Moreover, these effects are quite pronounced. Black males are more than 10 times as likely as white females with the same levels of education to be active lottery players. This effect is especially pronounced for less-educated black males. The model predicts that the incidence of active lottery play for that group is nearly 43 percent, which is more than 30 times the rate of play among nonblack females who have an education above the high school level (see Table 3).

The prekindergarten program disproportionately benefits blacks and persons who play the lottery, whereas the HOPE program more significantly benefits nonblacks and those with more education.

The distribution of the benefits of the two programs funded by the Georgia Lottery—the prekindergarten and HOPE scholarship programs—are quite different. The prekindergarten program disproportionately benefits blacks and persons who play the lottery, whereas the HOPE program more significantly benefits nonblacks and those with more education. Twenty-one percent of the survey respondents indicated that they had a child who attended a prekindergarten program, but less than half (10 percent) reported that their child attended a prekindergarten program funded by the Georgia Lottery. Black respondents were more likely to send their children to a lottery-funded prekindergarten program than were nonblack respondents. Furthermore, active lottery players, who are disproportionately black, were the most likely to enroll their child in a lottery-funded prekindergarten program, whereas nonplayers (not having played in the past year) were the least likely. This finding contradicts earlier studies that have found that those who play the lottery most frequently were least likely to benefit from its programs.

The results of our survey indicate that the HOPE scholarship is an effective program, enabling those without the financial means to attend a postsecondary institution and retaining students in the state who otherwise would have gone to college elsewhere. Overall, 22.9 percent of those surveyed indicated that at least one member of the household attended a postsecondary institution (public college, private college, or technical college) with the aid of the HOPE scholarship program. Seventy-six percent of HOPE recipients used the scholarship for a college or university education, and 24 percent used it to finance education at a technical college. Just over half of HOPE recipients (51.5 percent) decided to remain in Georgia because of the HOPE scholarship, and more than a quarter of HOPE recipients (27.2 percent) would not have been able to attend a college or technical school without the HOPE scholarship (see Table 3).

Not only is the Georgia Lottery regressive as a source of state revenue, but also the distribution of the benefits of lottery-funded programs tends

to exacerbate the inequities. Altering either the behavior of those who purchase lottery tickets or the popular HOPE scholarship program itself is politically unfeasible. However, with relatively minor policy adjustments, the regressive effects of the HOPE scholarship program could be reduced and additional services provided to Georgia residents who have low education levels:

- Lottery funds could be used to supply additional educational services to those who are behind their peers academically, either in the lower grades or at the college level. Programs such as after-school tutoring, remedial classes, and other educational programs that address existing deficiencies by stimulating learning in those students who have fallen behind may do more to alleviate regressivity by "leveling the playing field."
- Georgia could reduce minimum grade requirements for those whose incomes fall below a certain threshold. This reduction may allow more students to attend college, where they may reach their potential.
- Georgia could implement some form of means testing in the HOPE scholarship program for four-year colleges. A student whose family income is above a certain threshold would not qualify for a full scholarship. (Note, however, that a major intent of the HOPE scholarship program as it currently stands is to provide a means to retain the best and brightest students in Georgia.)

Introduction

Public support for lotteries is strong, as evidenced by public opinion surveys and the numbers of people who play lotteries and states that adopt lotteries. In order to make lotteries more appealing—and, ultimately, improve the likelihood of their adoption—legislative proposals to create public lotteries have targeted education as the beneficiary of lottery revenues. The research on this subject that does exist typically relies on aggregated analyses of county-level data instead of examining individual rates of play, benefit receipt, and public opinion. Few studies have integrated data on lottery play, opinion toward lotteries, and the receipt of benefits from lottery-funded programs. In this policy paper, these three factors are integrated in an examination of who plays the Georgia Lottery, who benefits from the lottery, and what participants' attitudes are toward the Georgia Lottery based on a 2000 survey of a sample of Georgia's population, including nonplayers, occasional players, and active lottery players. This survey was part of a larger research project analyzing the economic impacts of the Georgia Lottery that the Vinson Institute conducted for the Georgia General Assembly. The general findings of the survey are contained in the report from that project (see McCrary et al. 2001).

In the first part of this paper, we describe the methodology and sampling strategy. We then analyze who plays the Georgia Lottery and provide a description of the "typical" lottery player by examining the distribution of lottery players across demographic categories. We continue the analysis by focusing on three types of players: active players, occasional players, and nonplayers. Distinguishing the level of lottery play permits analysis of topics such as problem gambling and the regressivity of the lottery. The beneficiaries of the lottery-funded HOPE scholarship and prekindergarten programs are then discussed. This section concludes by combining the research on lottery players with that on lottery beneficiaries to examine the total economic incidence of the Georgia Lottery.[1] Public attitudes toward the lottery and the programs it funds are analyzed before concluding with a summary of findings and discussion of key public policy issues.

Research Approach

The methodology employed in this study was a statewide public opinion survey conducted by telephone interview. The Vinson Institute, in cooperation with external consultants who have expertise in survey research, developed a 58-item survey instrument based on a review of relevant lottery literature, including lottery surveys conducted in other states. (A copy of the questionnaire used for the survey is found in the appendix.) The research design specified the selection of a random sample to better ensure that each household with a telephone had an equal probability of being selected for the study, enhancing the representativeness of the sample. Telephone interviews were completed with 803 respondents. A sample size of 803 ensures that the sampling error is no greater than +/–3.4 percent, with a 95 percent level of confidence.

The University of Georgia's Survey Research Center drew the sample, conducted the telephone interviews, and coded the responses for computer analysis. Prior to the survey, telephone interviewers attended two separate, three-hour training sessions that included a review of survey methods, standard procedures of telephone interviewing, the purpose of the survey, and use of the survey instrument, along with a practice interview session. Supervisors at the Survey Research Center were present at all times during the telephone interviewing. In addition, for purposes of quality control, the supervisors randomly monitored more than 20 percent of the interviews.

Telephone numbers were selected by the standard process of random-digit dialing to ensure that all Georgia heads of household (including those with unlisted numbers) had the same or equal chance of being selected. Random-digit dialing often results in telephone numbers that are not in use; moreover, households that are contacted may not meet the interview criteria. In this study, the Survey Research Center initiated 5,240 telephone calls to identify 1,564 eligible respondents. Successful telephone interviews with heads of household were obtained with 803 of the 1,564 eligible respondents contacted. Thus, the response rate for the entire sample was 51.3 percent.

The examination of survey results pertaining to participation in the Georgia Lottery and attitudes toward the Georgia Lottery relies in part on logistic regression. Ordinary least squares regression is conducted on the assumption that the dependent variable (income, for instance) is continuous. By contrast, categorical variables are not continuous. Logistic regression is a special type of regression analysis used when the dependent variable consists of categorical data, such as whether or not a respondent

receives a service (referred to as a binary outcome) and type of lottery player (nonplayer, casual player, and active player) (Long and Freese 2001). Logistic regression predicts the probability that a specified outcome will occur. In the case of a binary dependent variable (yes/no), logistic regression predicts the probability that a case will take on the "yes" or "no" value based on the explanatory variables.[2]

Description of the Sample

The unit of analysis in this study is the head of household. The first survey question asked each respondent to identify whether he or she was "the person who owns or rents the place" where he or she lives. If the answer was "no," the interviewer asked to speak to the head of the household.

A description of the "typical" head of household can be seen from a composite of the most frequent responses to selected demographic and descriptive questionnaire items. The typical head of household in the survey sample has a mean age of 45 years and median age of 43 years (range = 18–95 years old) and has lived in Georgia for an average of 31 years (range = 1–94 years). The typical head of household is most likely to be a female (62.8 percent). Seventy-five percent of the survey's respondents were white, and 64 percent were married. Almost half of the heads of household (49.3 percent) reported that they had either completed a high school degree (28 percent) or attended some college (21.3 percent). In addition, nearly one-third of respondents (32.1 percent) reported that they had at least a college degree, including those who had a bachelor's degree (18.3 percent) and who had taken graduate courses or completed an advanced degree (13.8 percent). Only 11.6 percent reported having less than a high school education. Most heads of household reported that they were "currently employed" (66.2 percent). Additionally, 18.9 percent reported that they were retired; 6.8 percent were homemakers, and 2.3 percent were students. Six percent of respondents reported being unemployed, and 4.9 percent reported that someone in the household had received TANF benefits within the past year.

The sample drawn for the survey does not perfectly reflect the population of Georgia. Whites, females and homeowners are overrepresented in the sample compared with U.S. census bureau estimates for Georgia. The figures for unemployment and TANF recipients also are somewhat higher than reported figures for Georgia. Education levels of the sample in this survey approximate U.S. census bureau estimates. We address those instances in which the overrepresentation of a certain characteristic may influence the results of analysis.

Findings

In this section, we present the results of the Institute's statewide survey, focusing on public attitudes about the lottery and, more specifically, who actually plays and benefits from the Georgia Lottery. In general, Georgians support the lottery primarily because the revenues derived from the lottery are earmarked for education. In assessing who plays and benefits from the lottery, we classified respondents as nonplayers, casual players, and active players based on level or intensity of play and examined the demographic characteristics of respondents within this classification scheme. Although we recognize that educational expenditures generate significant social benefits, our analysis concentrates on the beneficiaries of the prekindergarten and HOPE scholarship programs.

Public Attitudes

In recent national surveys, respondents generally have been very supportive of legalized gambling. For instance, in a May 1999 Gallup survey of 1,523 American adults, 63 percent of respondents approved of legalized gambling, almost twice the percentage of those who did not approve of it (Gallup Organization 1999). Furthermore, support for legalized gambling in the form of public lotteries has been consistent over the past decade or so. Between 1989 and 1999, public support for public lotteries for cash prizes generally remained around 75 percent (Gallup Organization 1999).

The Vinson Institute survey asked respondents several questions about their attitudes toward the Georgia Lottery. When asked if they would vote to continue the lottery if a referendum were held, 78 percent responded that they would vote "yes" (McCrary et al. 2001). This level of support is consistent with results of other surveys about lotteries. There are only a few differences in the level of support afforded the lottery when a respondent's race, gender, age, education, income level, and type of player are examined (see Figure 1). There were no differences based on race, gender, income, or education. Older respondents and those respondents classified as nonplayers indicated that they were somewhat less likely to support the lottery in a referendum. However, a majority of all respondents in all groups stated that they would vote for the continuation of the lottery if a referendum were to be held on the issue.

Support for the lottery is closely tied to the lottery's funding of education programs. The Vinson Institute study found that more than two-thirds of respondents indicated that they would not want the lottery to continue if it did not fund education programs (see Figure 2). Moreover, most respondents would not support the lottery in a referendum if it did

Figure 1. Percentage of Respondents Who Would Support the Georgia Lottery, by Demographic Characteristics and Type of Play

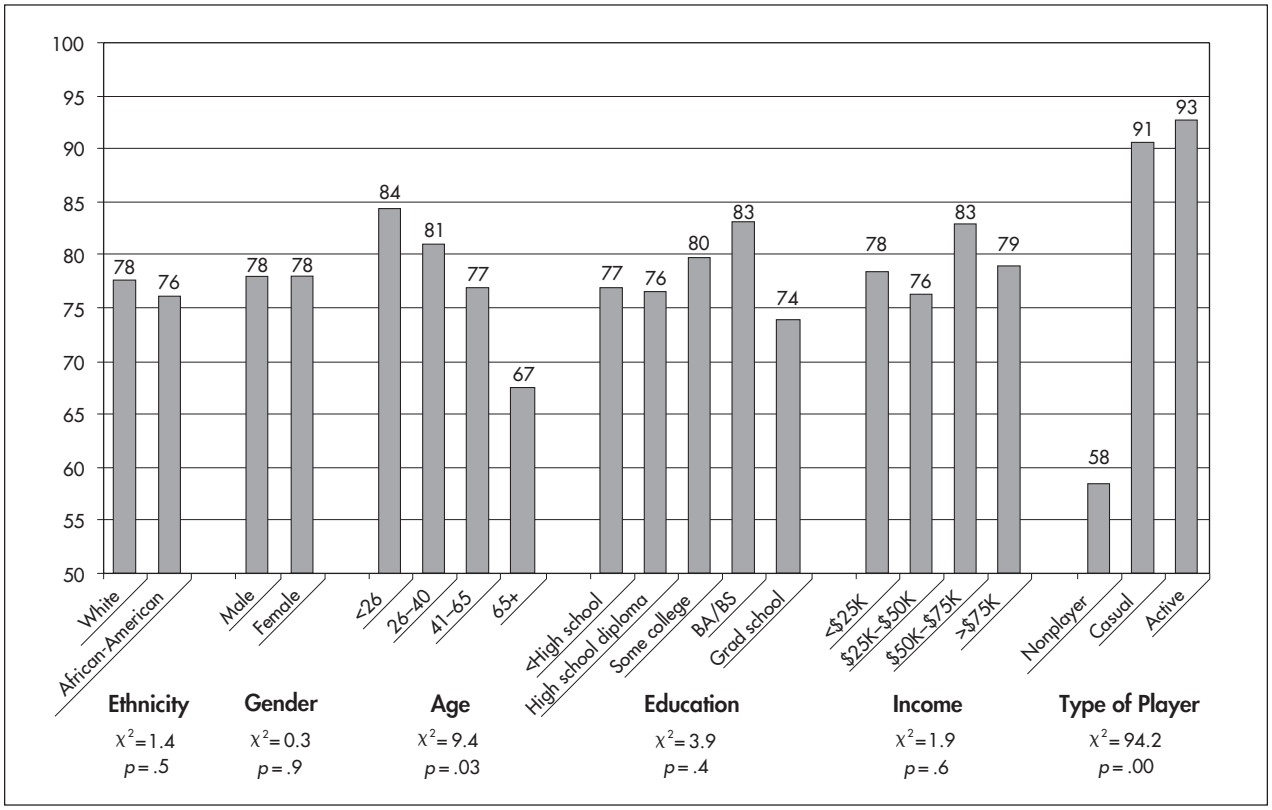
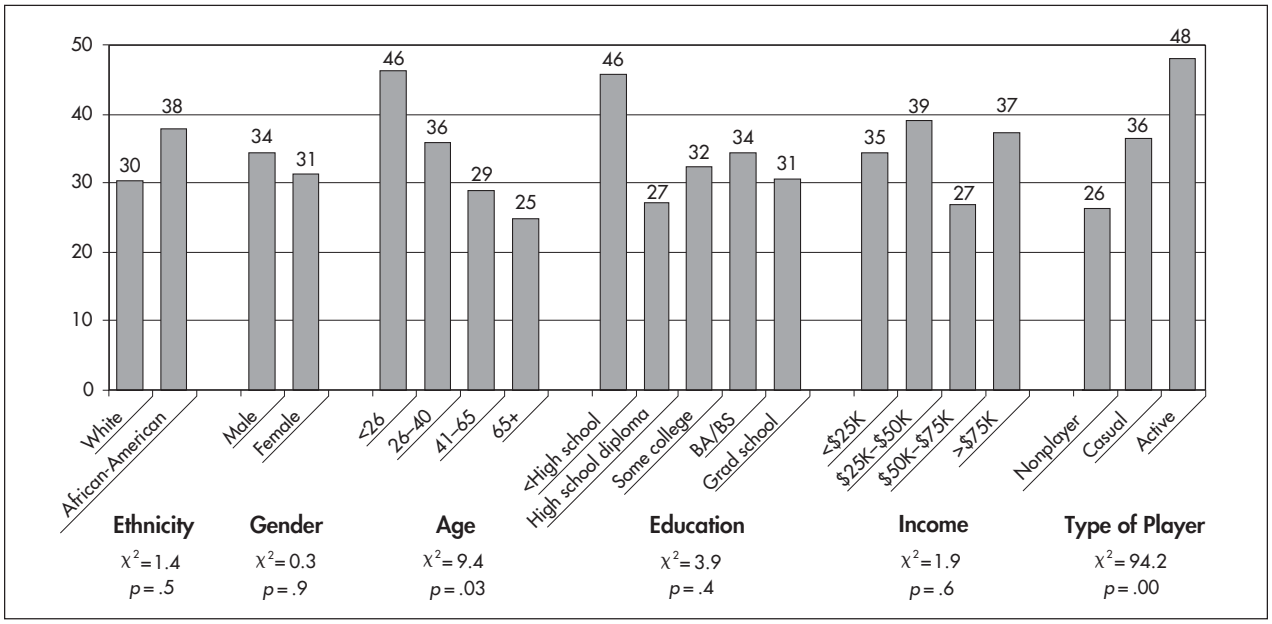


Figure 2. Percentage of Respondents Who Would Support the Georgia Lottery if the Lottery Did Not Support Educational Programs



Younger respondents, those with less education, and active lottery players were more likely than their counterparts to indicate support for the lottery, even if it did not fund education programs.

not support education (see McCrary et al. 2001). Statistically significant differences do exist between age strata, education levels, and types of players. Younger respondents, those with less education, and active lottery players were more likely than their counterparts to indicate support for the lottery, even if it did not fund education programs. Differences among gender, race, and income levels were statistically insignificant.

To facilitate further analysis, the two questions about supporting the lottery in a public referendum were combined into one variable with three categories—respondents who would not support the lottery at all, those who would support the lottery only if its funds supported education, and those respondents who would support the lottery regardless of how the proceeds were spent. Almost 25 percent of respondents would not support the lottery in a referendum, regardless of its purpose; 46 percent would support the lottery, but only if lottery revenues funded educational programs. The remaining 29 percent would vote to support the lottery, regardless of its intended purpose. This level of support was then entered into a series of ordered logit regressions with race, gender, age, education, income, type of player, and whether someone in the household received any benefit from a lottery-funded (i.e., HOPE or prekindergarten) program to determine the statistically significant predictors of the level of lottery support.[3] Only the type of player, whether the respondent had a college degree, and whether the respondent was under age 26 were statistically significant. Table 1 shows the results of the final model (in which only the remaining exogenous variables are statistically significant). The likelihood ratio chi-square of the final model is 77.26, with four degrees of freedom, indicating that the model is statistically significant. Possessing a college degree and being under age 26 increases the likelihood that a respondent will support the lottery in a referendum. Furthermore, the more active the lottery player, the more likely that respondent is to support the lottery.

The results of an ordinal logit model can be presented as probabilities that a respondent could be categorized according to a particular dependent variable, based on that respondent's characteristics included in the model. In this case, there are three outcomes in the dependent variable—whether the respondent would not support the lottery, would support the lottery only if its proceeds funded educational programs, or would support the lottery no matter what programs were funded by lottery proceeds. There are four statistically significant characteristics in this model that explain the degree of support—whether the respondent is a casual or active lottery player, whether the respondent is under age 26, and whether the respondent has a college degree. (Note that the type of player is

Table 1. Estimates of Support for the Lottery

Type	Respondent Characteristic				Probability of . . .			Increase in support
	Casual player	Active player	Age < 26	College degree	Not supporting the lottery at all	Supporting the lottery only if it funded education	Supporting the lottery no matter what it funded	
1	No	No	No	No	0.435	0.431	0.135	
2	Yes	No	No	No	0.176	0.465	0.259	1.281
3	No	Yes	No	No	0.141	0.437	0.423	1.521
4	No	No	Yes	No	0.290	0.483	0.226	1.256
5	No	No	No	Yes	0.345	0.470	0.185	1.159
6	Yes	No	Yes	No	0.102	0.385	0.513	1.589
7	Yes	No	Yes	Yes	0.072	0.322	0.606	1.642
8	No	Yes	Yes	No	0.080	0.341	0.579	1.628
9	No	Yes	Yes	Yes	0.056	0.276	0.668	1.670
10	No	No	Yes	Yes	0.219	0.482	0.300	1.383

mutually exclusive; that is, a respondent cannot be both a casual player and an active player.)

In Table 1, columns 2 through 5 show respondent characteristics of each possible combination. This distribution results in 10 separate types of respondents, based on all of the possible combinations of the explanatory variables. A Type 1 respondent possesses none of the characteristics and is included as a baseline comparison. A change in one of the respondent characteristics alters the probability that a respondent would support the lottery. Columns 6 through 9 in Table 1 show the probabilities that each type of respondent would not support the lottery, support it only if it funded education, and support the lottery no matter what it funded based on changes in characteristics. Note that the probability of not supporting the lottery decreases and the probability of providing unequivocal support increases as a respondent possesses more of the characteristics modeled in Table 1.

The model can then be used to develop estimates of the increase in support for the lottery, which is the ratio of the sum of the probabilities that a respondent would support the lottery divided by the sum of the probabilities that a Type 1 respondent would support the lottery. The last column in Table 1, then, is the increase in support for the lottery based on those characteristics. For instance, a Type 2 respondent, who is a casual lottery player over age 26 without a college degree, is 1.281 times more likely

to support the lottery than is a Type 1 player. Active players (Type 3) are more than 1.5 times as likely to support the lottery. This increase in support reaches a maximum of 1.67 times that of a Type 1 respondent.

To our knowledge, this is the first study to examine the degree of support for a lottery based on the types of programs that it funds; it is therefore not possible to compare these results with other states. That is, were this research to be replicated in other lottery states, the impact of demographic characteristics and lottery play may be very different from the patterns found here. Nonetheless, it is instructive to observe the effects of age, education, and frequency of lottery play on attitudes toward the lottery.

Who Plays?

In this section, we examine the demographic characteristics of lottery players, defined as those respondents who have bought lottery tickets in the past year. This section includes separate analyses of the relationships between lottery participation and income, education, race, and other demographic characteristics. It concludes with multivariate analyses incorporating all of the demographic variables. We then examine intensity of play more closely by categorizing lottery players into three separate categories: nonplayers, casual players, and active players.

Demographics of Players

Income

Research has shown that lotteries are "regressive" because citizens with less income tend to spend a greater proportion of their income on lottery products than do higher-income citizens. For example, the National Gambling Impact Study (1999) found that low-income individuals participate in lotteries at a much higher rate than do higher-income players. Clotfelter and Cook provide a thorough review of this literature in *Selling Hope: State Lotteries in America* (1989). In reviewing the recent literature on income and lottery participation, the Vinson Institute study team found that the regressivity finding remains largely consistent throughout the literature (McCrary et al. 2001). There have been similar results in surveys conducted in Pennsylvania (Spiro 1974), Connecticut and Massachusetts (Brinner and Clotfelter 1975), California (Clotfelter and Cook 1987), Canada (Livernois 1987; Vaillancourt and Grignon 1988), Illinois (Borg and Mason 1988), and Texas (Price and Novak 2000), as well as in analyses of aggregate sales data conducted on lotteries in Pennsylvania (Heavey 1978), Massachusetts (Brinner and Clotfelter 1975), Maryland (Clotfelter 1979), Michigan (Brinner and Clotfelter 1975), and Colorado (Hansen 1995). Some studies have found that higher-income groups spend

more on lotteries in absolute dollars but that those in lower-income brackets spend a larger proportion of their income on lotteries (Abbot and Cramer 1993; Herring and Bledsoe 1994; Brown, Kaldenberg, and Brown 1992). Among lower-income groups, playing the lottery often is perceived as the only way to escape from poverty (Brenner 1986; Herring and Bledsoe 1994). Through analyses of aggregate sales data, both Rubenstein and Scafidi (1999) and Cornwell and Mustard (1999) conclude that low-income individuals in Georgia are disproportionately more likely to play the lottery relative to higher-income people.

The Vinson Institute study found that the percentage of each income group (i.e., less than $25,000; $25,000–$50,000; $50,000–$75,000; and greater than $75,000) that purchased a lottery ticket at least once within a year varied between 52.8 percent and 62.9 percent (McCrary et al. 2001). Thus, the rate of play across income categories is relatively consistent, indicating that income is not related to whether an individual has purchased a lottery ticket in the past year.[4] (Note that this is not a test of the regressivity of lottery play because we did not determine how much respondents spent on lottery tickets. Rather, the study addressed only whether or not someone had purchased a lottery ticket within the past year.) The lottery ticket–purchasing behavior of the survey respondents largely reflects nationwide trends that show that rates of play vary between 53 percent and 65 percent (Gallup Organization 1999).

The rate of play across income categories is relatively consistent, indicating that income is not related to whether an individual has purchased a lottery ticket in the past year.

Previous research has found that players from lower-income households may be more likely to purchase tickets more frequently. Thus, we might expect respondents from lower-income households compared with those from higher-income groups to be more likely to play games that occur more frequently. In Georgia, Keno draws occur every few minutes. Players know immediately the results of instant games. Pick 3 and Fantasy Five draws occur daily. The Big Game and Lotto, by contrast, are drawn several times per week.

Of these six games, only instant games and Pick 3 are statistically associated with income. Approximately 31 percent of all respondents purchased instant game lottery tickets in the previous year. However, lower-income respondents were nearly twice as likely to have purchased instant game tickets in the previous year than were higher-income respondents (McCrary et al. 2001).[5] That is, almost 41 percent of respondents who made less than $25,000 per year purchased instant game lottery tickets compared with only 24 percent of respondents making more than $75,000 annually.

The relationship between income and rates of play of Pick 3/Pick 4 is similar. As respondents' incomes increase, the likelihood that they play

Pick 3/Pick 4 decreases (McCrary et al. 2001).[6] The rate of play for Pick 3/Pick 4 is much lower than that of instant games, with 16 percent of respondents indicating that they play Pick 3/Pick 4, compared with 31 percent for the instant game. Those in the two lowest-income categories are twice as likely to have played Pick 3/Pick 4 as those in the highest-income category, however.

Although income is not statistically related to whether a respondent has played any of the other games offered by the Georgia Lottery in the past year, there are some notable differences among respondents. A higher proportion of heads of households earning less than $25,000 per year compared with those in other income categories played Fantasy 5 (which is drawn daily) at least once in the past year. Further, fewer households earning less than $25,000 per year played Lotto and the Big Game at least once in the past year compared with those in other income categories. Thus, the Georgia survey provides support for the argument that lower-income persons are more likely than higher-income persons to play lottery games that are drawn more frequently.

The Georgia survey provides support for the argument that lower-income persons are more likely than higher-income persons to play lottery games that are drawn more frequently.

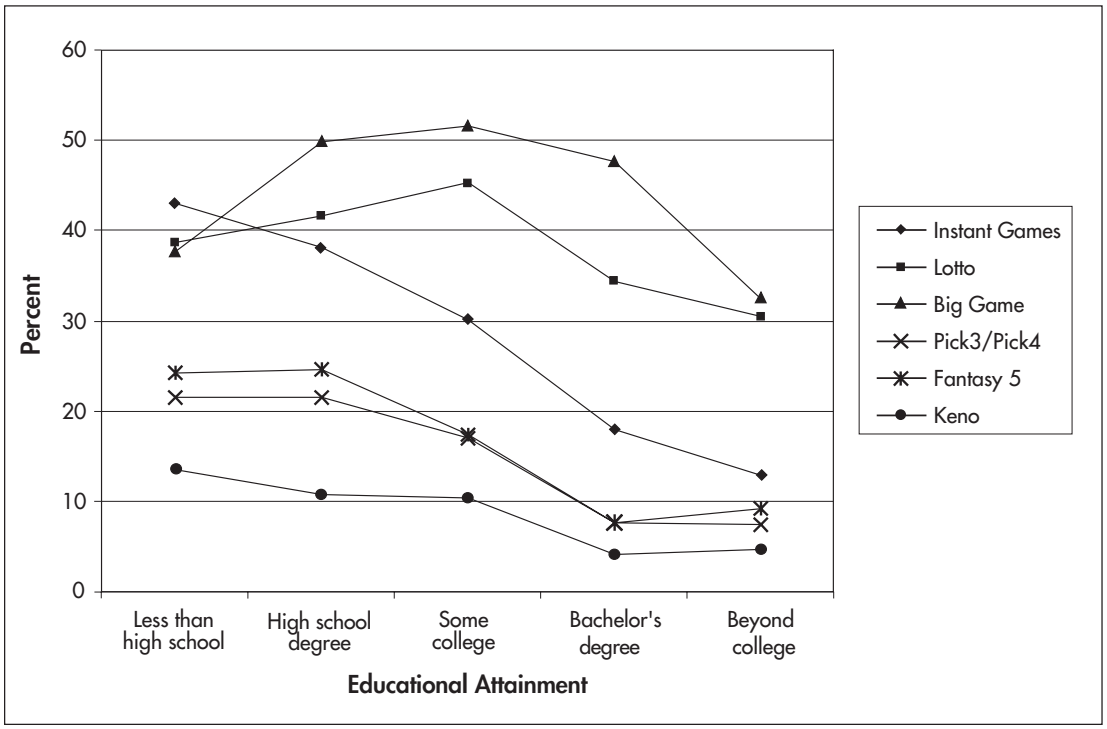
Education

Previous research also has found that those with less education disproportionately play lotteries. Lottery expenditures are inversely related to formal education (Clotfelter 1979; Clotfelter and Cook 1987; 1990; Brown, Kaldenberg, and Browne 1992; Herring and Bledsoe 1994). Players with less than a high school education spend more than people with at least a high school diploma (Stranahan and Borg 1998). Price and Novak (2000) concluded that people with a college education play at lower rates than does the rest of the population. In fact, Mikesell (1989) has argued that education is the most influential variable in determining lottery ticket purchasing.

The Vinson Institute survey found that education is significantly related to lottery ticket purchasing. Those with more education, especially respondents who have a postgraduate education, were the group least likely to have purchased a lottery ticket in the past year. The results are consistent among each of the six games offered by the Georgia Lottery (see Figure 3).[7] For each game, as education increased beyond "some college," the percentage of respondents reporting that they had purchased a ticket in the past year decreased. The relationships between education and the response to each of the games being played are statistically significant.[8]

Two patterns emerge in the data in Figure 3. First, the percentage of respondents indicating that they purchased tickets for the Big Game

Figure 3. Lottery Purchasers, by Type of Game and Education



and Lotto increases as education increases until the "some college" category, then the percentage decreases. Second, less-educated respondents were more likely to have played games that are drawn more frequently (i.e., Instant Games, Pick 3/Pick 4, Fantasy 5, and Keno). Thus, respondents with less education are significantly more likely to play games that are drawn more frequently than are those with more education.

Race

Existing research supports the contention that lottery play is heaviest among blacks. Lottery expenditures are disproportionately higher for blacks than for whites (Clotfelter 1979; Clotfelter and Cook 1987; Borg and Mason 1988; Herring and Bledsoe 1994; Hansen 1995; National Gambling Impact Study Commission 1999, 3–4; Price and Novak 2000). Stranahan and Borg (1998) have argued that, although blacks are not more likely to play lotteries than are whites, blacks who do play spend more than whites who play. The Vinson Institute survey found that there are no differences among white, black, and other races in terms of rates of overall lottery play. Indeed, the percentage of respondents in each racial category reporting that they had purchased a lottery ticket in the past year was nearly identical, at around 57 percent (McCrary et al. 2001).

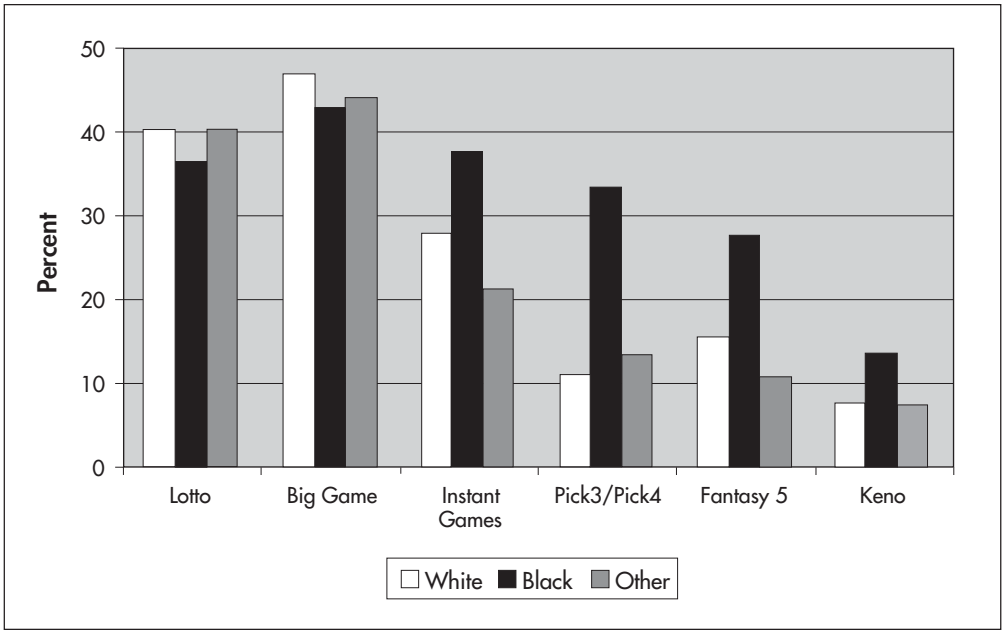
There are substantial racial differences in lottery participation for individual games, however. Figure 4 shows that blacks are much more likely to have played Instant Games, Pick 3/Pick 4, Fantasy 4, and Keno—that is, the games that are drawn most frequently (at least daily)—than are those in other racial categories. Each of these relationships is statistically significant.[9] The two most frequently cited games were Georgia Lotto and the Big Game, which underscores their widespread popularity. There were no statistical differences by race for either Lotto or the Big Game.

Summary of Demographics

Results from the Vinson Institute survey show little difference in overall participation in the Georgia Lottery by respondents' race, income, or education. Differences are apparent, however, when the data are examined with regard to specific games. Blacks, those respondents with less than a college education, and those respondents whose household income does not exceed $50,000 were more likely to have purchased lottery tickets for those games with frequent draws in the past year than were whites, those with at least a college education, and those with household incomes greater than $50,000.

Previous research has illustrated that blacks, those who have less education, and those individuals in lower-income strata typically participate more frequently in lotteries than do individuals from other groups.

Figure 4. Lottery Game Participation, by Race



In the next section, intensity of lottery play is measured to determine if there are any correlations between lottery play and demographic characteristics.

Intensity of Play

A substantial body of research exists that attempts to determine the prevalence of excessive gambling behavior among the general public and specific subgroups. Most of this research has focused on gambling behavior in general, and some has focused specifically on lotteries. For example, Grun and McKeigue (2000) examined the effect that the introduction of a national lottery in Great Britain had on excessive gambling behavior, as measured by the percentage of respondents indicating that they spend more than 10 percent of their income on gambling. They found that the percentage of those gambling more than 10 percent of their income quadrupled after Great Britain implemented a national lottery (see Figure 5). Excessive gambling increased eightfold among those in the lowest income category. There also were substantial increases in excessive gambling in the next three highest income categories, with no pronounced changes among those in the highest two income categories.

The Georgia Lottery survey respondents were classified as nonplayers, casual players, and active players. Nonplayers are those respondents who had not purchased a lottery ticket in the previous year and account for nearly half of those surveyed (49 percent). Most of the respondents are

Figure 5. Excessive Gambling Behavior Before and After the British National Lottery

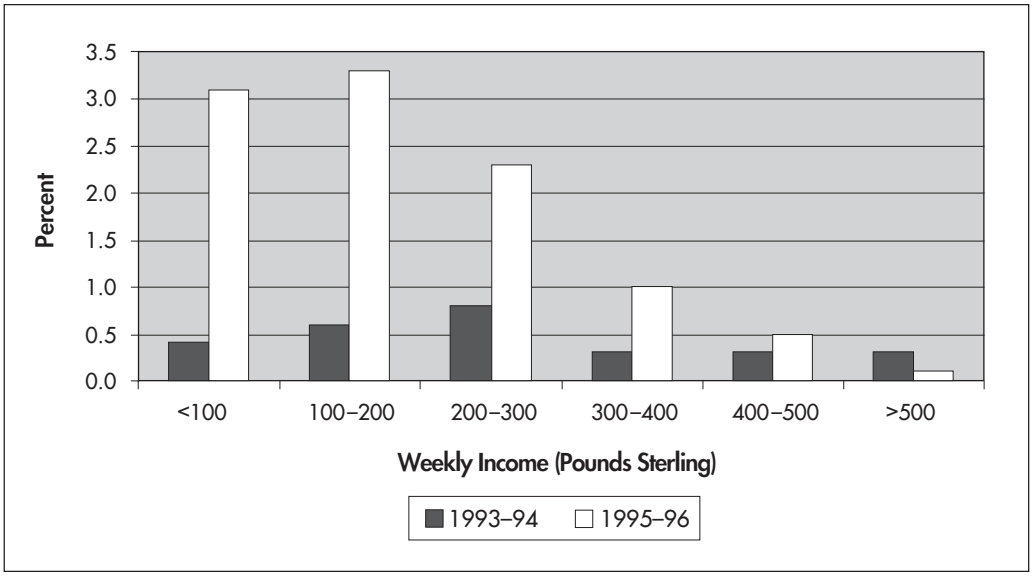
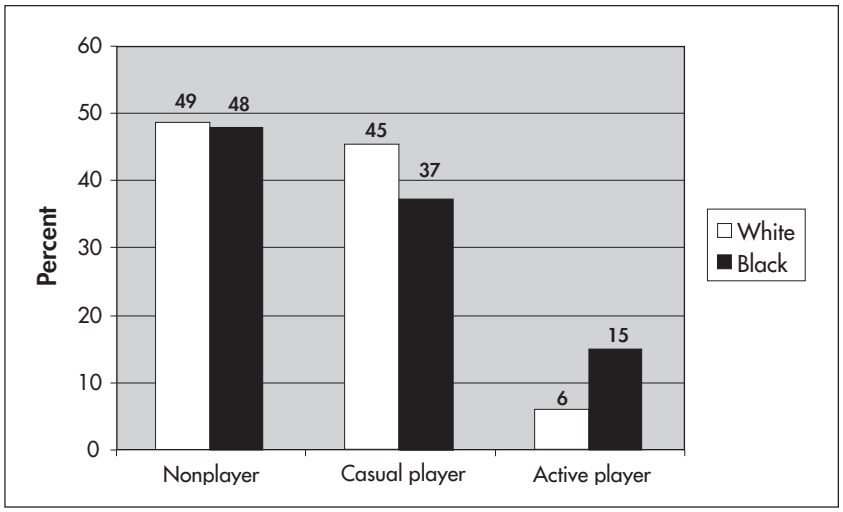


Figure 6. Lottery Play, by Race



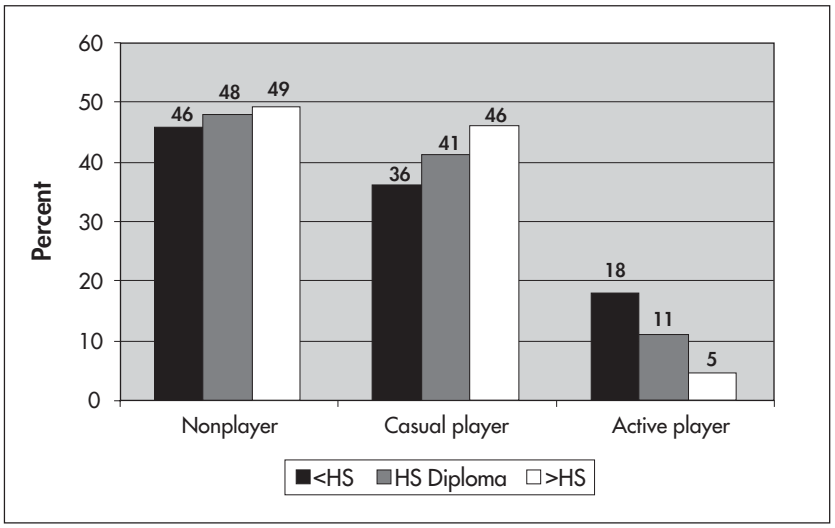
casual players who purchase lottery tickets either several times a year or monthly and who spend less than $10 per week on lottery tickets on average. The smallest group (8 percent) comprises active players who spend more than $10 per week on lottery tickets and play the lottery at least once per week.[10]

Whites were more likely to be casual players, and blacks were more likely to be active players.

In the Vinson Institute study, race and education were statistically related to type of player, but income was not.[11] Figure 6 shows the distribution of the three types of players by race. [12] Almost half of both whites and blacks had not purchased a lottery ticket in the previous year. Whites were more likely to be casual players, and blacks were more likely to be active players.[13] Those who had obtained the equivalent of a high school education or less were more likely to be active lottery players than were those who had at least some college education (see Figure 7).[14] A higher percentage of those who had educational levels above high school were casual players compared with those who had the equivalent of a high school education or less. Higher percentages of those with less education compared with those who have formal education above the high school level indicated that they were active lottery players.

Table 2 shows the logistic regression results of predicting active lottery play based on race, gender, and education. The four explanatory variables used in the model are whether a respondent is black, male, has less than a high school degree or GED, and has attained a high school degree or GED but does not have an education above the high school level. Thus, the control group in this model is nonblack females with more than a high

Figure 7. Lottery Play, by Education



Note: HS = high school.

school education. The chi-square test for the model (41.52, with four degrees of freedom) indicates that the overall fit of the model is statistically significant. That is, the variables used in the model predict the incidence of active lottery play among survey respondents. Similarly, the explanatory variables in the model correctly predict 78 percent of the time whether a respondent is an active lottery player. Further, a Pearson goodness-of-fit test of the observed values compared with the expected values of the dependent variable (active lottery play) derived from the model is statistically insignificant (chi-square with seven degrees of freedom equals 6.31, $p = .504$). This statistical insignificance indicates that there is no statistical difference between the active lottery play reported by respondents and that predicted by the model.

Table 2. Logit Regression Coefficients Predicting the Probability That the Respondent Is an Active Lottery Player

	Coefficient	Standard Error
Intercept	– 4.22*	.36
Race (0 = nonblack, 1= black)	1.22*	.33
Gender (0 = female, 1= male)	1.31*	.33
Less than high school (0 = HS and beyond, 1= less than HS)	1.39*	.43
High school or GED degree (0 = beyond HS and less than HS, 1= HS degree or GED)	0.95**	.37

Notes: * $p = .000$; ** $p = .010$. Model chi-square with four degrees of freedom equals 41.52, $p = .000$.

The interpretation of the coefficients in Table 2 is not straightforward because logistic regression predicts the probability of an event occurring (in this case, the probability of a respondent being an active lottery player). There are four explanatory variables and an intercept in the model presented in Table 2. Each of the four explanatory variables is coded such that a 1 for race indicates that the respondent is black, and a 0 indicates that the respondent is not black. The intercept, then, represents the logit coefficient for nonblacks, females, and those who have an education above the high school level (0 values on all of the explanatory variables). Transforming that coefficient into a probability results in a probability of .014 that a nonblack female with a greater than high school education will be an active lottery player. An alternative explanation is that the model predicts that 1.4 percent of nonblack females who have an education above the high school level will be active lottery players. The interpretation of the coefficients in Table 2 is that blacks, males, those who have not finished high school, and those with a high school diploma or GED are more likely to be active lottery players than are nonblacks, females, and those who have an education above the high school level. Holding the other explanatory variables constant yields the following findings:

Blacks, males, those who have not finished high school, and those with a high school diploma or GED are more likely to be active lottery players than are nonblacks, females, and those who have an education above the high school level.

- Blacks are three times more likely than nonblacks to be active lottery players.
- Males are almost four times as likely as females to be active lottery players.
- An individual without a high school degree or GED is more than four times as likely to be an active lottery player as an individual who has an education above the high school level.
- A high school graduate is two and a half times more likely than someone who has an education above the high school level to be an active lottery player.

The probability of being an active lottery player greatly increases as an individual has more of the traits associated with active lottery play. Table 3 shows the probabilities of being an active lottery player for each of the combinations of explanatory variables in the model in Table 2. Black males are more than 10 times as likely as white females with the same levels of education to be active lottery players. This effect is especially pronounced for less-educated black males; the model predicts that the incidence of active lottery play for that group is nearly 43 percent, which is more than 30 times the predicted incidence for nonblack females who have an education above the high school level.

Table 3. Probability of Being Classified as an Active Lottery Player for Each Category of Explanatory Variable

Race	Sex	Education	Probability	Percent Change from Intercept
Nonblack	Female	Beyond HS	0.014	Intercept
Black	Female	Beyond HS	0.047	227.40
Nonblack	Male	Beyond HS	0.052	256.64
Black	Male	Beyond HS	0.156	975.37
Nonblack	Female	HS degree	0.037	152.76
Black	Female	HS degree	0.114	687.34
Nonblack	Male	HS degree	0.123	752.34
Black	Male	HS degree	0.323	2129.81
Nonblack	Female	Less than HS	0.056	284.68
Black	Female	Less than HS	0.167	1050.02
Nonblack	Male	Less than HS	0.179	1138.89
Black	Male	Less than HS	0.426	2837.77

Note: HS = high school.

Who Benefits?

The previous two sections focused on lottery players, whose ticket purchases fund programs that receive the net proceeds of the lottery. The Georgia survey results largely corroborate what is known about lottery play. First, blacks and the less educated are more likely to be active lottery players. Second, lottery play is regressive in that individuals with lower incomes spend a higher percentage of their incomes on lottery tickets. This section focuses on who benefits from the lottery by examining survey responses to questions about participation in the lottery-funded HOPE scholarship and prekindergarten programs. If lottery expenditures fund programs that benefit low-income, less-educated minorities, the regressive nature of the lottery "tax" may be offset. Conversely, regressivity would be exacerbated if lottery-funded programs disproportionately benefited whites with more education and higher incomes.

Several recent studies have maintained that a full analysis of the distributional impact of a lottery must consider both the sources of lottery revenues and the beneficiaries of lottery-funded expenditures. In Illinois, although lottery expenditures for education are distributed in a slightly progressive manner, the overall regressivity of the lottery remains "quite pronounced, especially in the lower-income categories" (Borg and Mason 1988, 81). In a study of the Florida lottery, Borg, Mason, and Shapiro (1991) found that lottery-funded expenditures for K–12 education dispropor-

tionately benefit those at higher incomes. Furthermore, they found that lottery benefits outweigh the tax burden for all income groups except the lowest.

Lottery sales in Georgia remain consistent across counties, averaging about $200 per capita.

In the case of Georgia, Rubenstein and Scafidi (1999) utilized county data on education, race, income, lottery purchases, and HOPE expenditures to examine the distribution of lottery expenditures by program. They found that white Georgia households receive more in lottery benefits than they spend, whereas nonwhites spend more on the lottery than they receive in benefits. Net benefits from the lottery also were found to be a function of income, with households earning less than $25,000 and between $35,000 and $50,000 experiencing average annual losses (negative net benefits) from the lottery. Net benefits were positive for households in all other income groups. Rubenstein and Scafidi (1999, 18) concluded that the overall impact of the Georgia Lottery is regressive, and "much of the regressivity of lottery benefits is attributable to the HOPE scholarship." Cornwell and Mustard (1999) determined that counties at the highest income level receive over 40 percent more HOPE college scholarships (and 90 percent more in scholarship dollars) than counties at the lowest income level. Further, counties with a higher percentage of black population receive a significantly smaller portion of HOPE scholarships. However, lottery sales in Georgia remain consistent across counties, averaging about $200 per capita. This finding implies that, as a percentage of income, lottery revenue per capita is higher in low-income counties than high-income counties. The results of both studies provide at least preliminary evidence to support the criticism that the HOPE scholarship program contributes to the lottery's revenue regressivity by disproportionately favoring students from wealthier households.

Lottery opponents argue that the incidence of the lottery is regressive: that the poor buy the tickets and higher-income citizens receive the benefits. The Vinson Institute study (McCrary et al. 2001) presented evidence relating to the economic incidence of the Georgia Lottery and found some support for the regressivity argument. However, there are alternative explanations for the disparities in distribution of benefits. HOPE scholarships are unevenly distributed throughout the state. Those who live in areas in which there is a public university are more likely to receive a HOPE scholarship and are more likely to retain their HOPE scholarship through their senior year. Further analysis also indicates that race has a correlation with the HOPE college scholarship program; minorities are slightly less likely than whites to receive a HOPE scholarship, and those that do receive a HOPE scholarship are more likely to lose their scholarship while in college.

Other lottery-funded programs provide benefits to different areas of Georgia. The technical college assistance portion of HOPE and the prekindergarten program benefit areas of the state that have not benefited from the HOPE college scholarship program. The "Computers in the Classroom" program benefits all school districts; however, lack of computer training may unduly affect those districts that are unable to afford teacher training. Many school construction program dollars have gone to school districts in the Atlanta metropolitan area (however, the school construction program is designed to benefit rapidly growing school districts).

Prekindergarten Program

Even though more than 21 percent of survey respondents had a child who attended a prekindergarten program within the past five years, only 10 percent reported that their child attended a prekindergarten program funded by the Georgia Lottery. Thus, half of those enrolling their children in a prekindergarten program are not utilizing lottery funding.

Race and age were statistically related to whether or not a respondent's child attended a lottery-funded prekindergarten program. First, black respondents were more likely to enroll their children in a lottery-funded prekindergarten program than were nonblack respondents. Ten percent of all respondents enrolled their child in a lottery-funded prekindergarten program (16 percent of black respondents and 8.6 percent of nonblack respondents).

Second, respondent age also was statistically related to whether a respondent had a child who attended a lottery-funded prekindergarten program. This finding is not surprising, given that those respondents over 65 years of age are very unlikely to have children young enough to have attended a prekindergarten program within the previous five years. Excluding age from the analysis does not affect the statistically significant relationship between a respondent's age and whether a respondent's child attended a lottery-funded prekindergarten program. Respondents between the ages of 26 and 40 were substantially more likely to send children to a lottery-funded prekindergarten program than were either those above 40 or below 26.[15]

Eleven percent of respondents below the age of 65 had a child who attended a lottery-funded prekindergarten program. Among respondents between the ages of 26 and 40, 18.8 percent indicated that their child attended a lottery-funded prekindergarten program compared with less than 7 percent of respondents younger than 26 or older than 40.

Third, type of lottery player was significantly related to whether a respondent had a child who attended a lottery-funded prekindergarten

program. Those classified as nonplayers (i.e., not having played in the past year) were the least likely to enroll their child in a lottery-funded prekindergarten program (6.9 percent), whereas those who were classified as active lottery players were the most likely (18.2 percent). This finding counters earlier suggestions that those who play the lottery most frequently are least likely to benefit from its programs.

The relationships between several other variables and enrollment in a lottery-funded prekindergarten program were statistically insignificant. A respondent's level of education had no effect on whether or not a respondent's child attended a lottery-funded prekindergarten program. Income also was unrelated to enrollment, although the distribution was slightly skewed toward those households earning between $25,000 and $50,000. The area in which a respondent lived also was unrelated to enrollment; that is, respondents in urban, suburban, and rural areas of the state were equally likely to report that their child attended a lottery-funded prekindergarten program.[16]

The prekindergarten program benefits blacks and lottery players more so than nonblacks and nonlottery players.

In sum, the prekindergarten program benefits blacks and lottery players more so than nonblacks and nonlottery players. Second, although survey respondents' incomes and levels of education were not related to whether a respondent's child attended a lottery-funded prekindergarten program, earlier results published by the Vinson Institute demonstrate that the rate of enrollment in such programs is higher in less affluent areas of the state. These results counter earlier findings suggesting that lottery players do not receive benefits of lottery-funded programs proportional to rate of play. There are several plausible explanations for these differences. First, earlier studies (see Rubenstein and Scafidi 1999; Cornwell and Mustard 1999) focused on aggregate data, typically at the county level. Second, Borg and Mason (1988) and Borg, Mason, and Shapiro (1991) focused on overall lottery expenditures, not individual programs funded by lottery receipts. By contrast, this study uses individual-level survey responses to estimate benefits.

HOPE Scholarship Program

Overall, 23 percent of those surveyed indicated that at least one member of the household attended a postsecondary institution (i.e., public college, private college, or technical college) with the aid of the HOPE scholarship program. Most HOPE recipients (60 percent) attended a public college or university; 16 percent attended a private college. Thus, 76 percent of those households in the sample that had a HOPE recipient used HOPE for a college or university education, and 24 percent of recipients used HOPE for a technical school education.

Two of the intended purposes of the HOPE programs are to enable those without the financial means to attend a postsecondary institution and to retain students in Georgia who would otherwise attend college outside of the state. The Vinson Institute survey asked respondents who had indicated that someone in the household had received a HOPE scholarship if that person chose to remain in the state of Georgia because of the HOPE scholarship and if that person would have attended a postsecondary institution without the HOPE scholarship. Slightly over half of HOPE recipients decided to remain in Georgia because of the HOPE scholarship (see Table 4). Slightly fewer HOPE recipients who attended a public college or university remained in Georgia because they received the HOPE scholarship; over half of those who attended a private college or technical school remained in Georgia because they received the HOPE scholarship.

Second, the HOPE scholarship program clearly has enabled those without the financial means to attend a postsecondary institution. Overall, more than one-fourth of HOPE recipients would not have been able to attend a college or technical school without the HOPE scholarship (see Table 4). Nearly half of those attending a technical school and slightly more than one-fourth of public college attendees would not have been able to enroll without the HOPE scholarship.

Overall, more than one-fourth of HOPE recipients would not have been able to attend a college or technical school without the HOPE scholarship

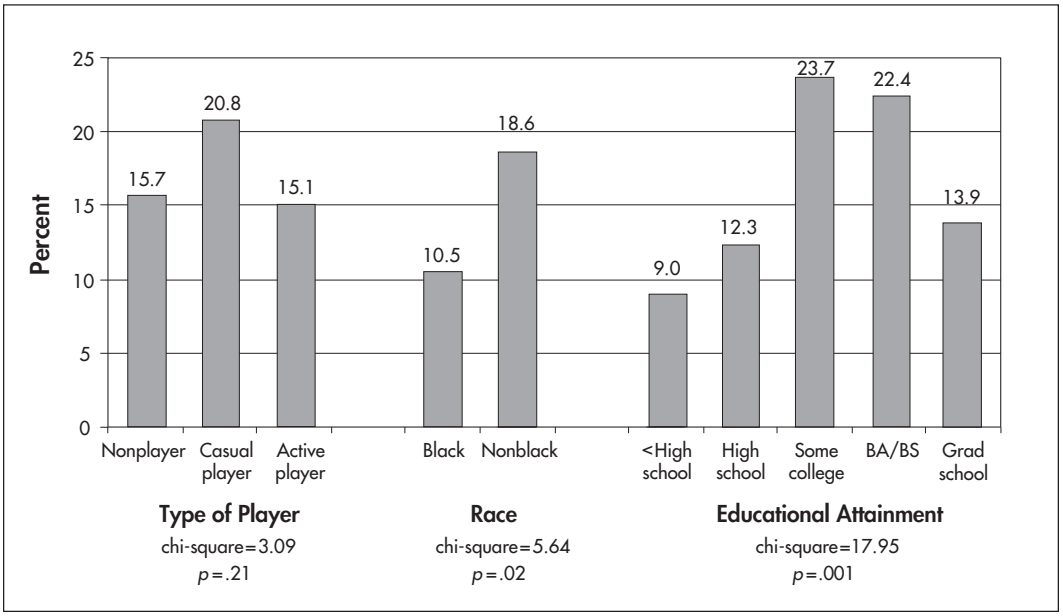
Figure 8 presents the relationships between the type of player, race (i.e., black/nonblack), and educational attainment of a respondent and whether someone in the respondent's household has received a HOPE scholarship to attend college. Type of player is not related to whether someone in the household received a HOPE scholarship. Black respondents were significantly less likely to have someone in the household who received a HOPE scholarship. As the educational attainment of a respondent

Table 4. Impacts of HOPE Scholarship Program on Decision to Remain in Georgia for Post-Secondary Education and on Ability to Attend a Post-Secondary Institution

Type of Institution	Percent indicating the recipient remained in Georgia because of receiving HOPE	Percent indicating HOPE recipient would not have attended post-secondary institution without HOPE
Public college	48.6	26.7
Private college	56.0	14.3
Technical school	56.4	37.5
All institutions	**51.5**	**27.2**

increased, the likelihood of someone in the household receiving a HOPE scholarship increased until the educational attainment of the respondent reached graduate school. At that point, there was a drop-off in the percentage of those receiving a HOPE scholarship.

Figure 8. Percentage of Respondents Indicating That Someone in the Household Has Received a Hope Scholarship, by Type of Player and Demographic Group



Summary and Policy Conclusions

The research reported here corroborates previous findings that the lottery is regressive. Those who earn less spend a higher percentage of their incomes on the lottery than do those who earn more. Likewise, the HOPE scholarship program for four-year public colleges largely benefits those who are likely to attend college even without the HOPE scholarship.[17] Although the popularity of the HOPE scholarship program makes drastic changes politically infeasible, several steps may be taken to reduce the regressivity of the HOPE scholarship program and provide additional services to those who may be behind their peers academically. Based on the research reported here and other studies, we recommend the following:

- Georgia could implement means testing in the HOPE scholarship program for four-year colleges. A student whose family income is above a certain threshold would not qualify for a full scholarship. (Note, however, that a major intent of the HOPE scholarship program as it currently stands is to provide a means to retain the best and brightest students in Georgia.)
- Lottery funds could be used to supply additional educational services to those who are behind their peers, either in the lower grades or at the college level. Programs such as after-school tutoring, remedial classes, and other educational programs that address existing deficiencies by stimulating learning in those students who have fallen behind may do more to alleviate regressivity by "leveling the playing field."
- Georgia could reduce minimum grade requirements for those whose incomes fall below a certain threshold. This reduction may allow more students to attend college, where they may reach their potential.

Despite the regressive aspects of the lottery, the results of the survey as well as earlier research demonstrate that the programs funded by lottery receipts benefit most Georgians. Minorities and the less educated tend to play the lottery more frequently than do other groups and are more likely to be active lottery players. These groups and those who live in low-income areas of Georgia benefit from the lottery-funded prekindergarten program more than do other groups and areas of the state.

Despite the regressive aspects of the lottery, the results of the survey as well as earlier research demonstrate that the programs funded by lottery receipts benefit most Georgians.

The lottery in Georgia enjoys tremendous public support because its net proceeds fund highly visible education programs. Without this

earmarking of funds, a referendum would likely result in the demise of the lottery. We recommend that periodic evaluations of lottery-funded programs be conducted to determine whether the lottery moneys that are spent on education are achieving their intended goals. For example, additional surveys could be used to determine where HOPE scholars settle after college. That is, to what extent are HOPE scholars relocating out of state after college, negating much of the intended benefit of the HOPE college scholarship program? Moreover, although lottery funds have been used to purchase hardware and software for education, schools have not been provided lottery funds to train teachers and media specialists to use technology in instruction. Use of technology in the classroom should be evaluated to ensure that instruction is being enhanced.

Notes

1. Economic incidence simultaneously assesses both who benefits from a particular public program and who provides the funds for that program. The economic incidence of the Georgia Lottery, then, is determined by combining who plays the lottery with who benefits from lottery-funded programs.
2. For example, to predict whether a person receives a HOPE scholarship based on that person's race, gender, and household income, the dependent variable in this model is dummy coded 0/1, 0 for not receiving the scholarship and 1 if the person does receive the scholarship. The logistic regression model is:

   $\ln(p/(1-p)) = \alpha + \beta_1 * race + \beta_2 * gender + \beta_3 * income + \varepsilon$ (equation 1),

   where p is the probability of receiving the scholarship, ln is the natural log function, a is the intercept, β_1 to β_3 are the logistic regression parameters, and e is the stochastic error term. The term $(p/(1-p))$ is the odds ratio, and the term $\ln(p/(1-p))$ is the log odds ratio, or the logit (see John Whitehead, *An Introduction to Logistic Regression*, http://personal.ecu.edu/whiteheadj/data/logit/). Analyzing the dependent variable as a logit ensures that results will be meaningful; no result will ever be less than 0 or more than 1, which is true for all probabilities.

   The logistic regression parameters (β_1–β_3) require interpretation. Under ordinary least squares, regression parameters estimate the change in the dependent variable from a one-unit change in the explanatory variable. In logistic regression, each parameter is the amount of change in the logit from a one-unit change in the explanatory variable. These parameters can be converted back to probabilities and odds ratios algebraically by solving for p in equation 1. Odds ratios present the probability of the person receiving the HOPE scholarship divided by the probability of the person not receiving the HOPE scholarship and can be interpreted as the increase in the odds that a person would receive a HOPE scholarship under a particular set of conditions.
3. An ordered logit regression is a type of logistic regression where the dependent variable has more than two outcomes.
4. The chi-square value of the difference between income categories is statistically insignificant at chi-square = 3.98, with three degrees of freedom (*df*).
5. The difference between the four categories was statistically significant at $p < .01$, chi-square = 11.88, $df = 3$.
6. The difference between the four categories was statistically significant at $p < .10$, chi-square = 6.97, $df = 3$.
7. $p < .05$, chi-square = 10.44, $df = 4$.
8. The chi-square values (in parentheses) for each game are Instant Game (9.83); Lotto (8.75); Big Game (14.86); Pick3/Pick4 (20.95); Fantasy 5 (25.66); and Keno (10.23). All are significant at the $p < .05$ level, except for Lotto, which is significant at the $p < .10$ level.
9. The chi-square and probability values (in parentheses) for each game are Instant Game (8.19, $p = .017$); Pick3/Pick4 (46.48, $p = .0001$); Fantasy 5 (14.90, $p = .001$); and Keno (5.30, $p = .071$).

10. The categories used here are not meant to correspond to any of the categories of gamblers presented in the literature on pathological gambling. The survey design was not intended to measure the prevalence of clinically defined pathological gambling among lottery players in Georgia; rather, it was to obtain data on lottery play among the general population.
11. The chi-square statistic for the relationship between income and intensity of play was 6.08, with six degrees of freedom ($p = .41$).
12. Note that only white and black are included in Figure 6. There were too few respondents from the "other" racial category to include in the analysis.
13. The chi-square for the difference in type of player by race is 12.84, with two degrees of freedom ($p = .002$).
14. The chi-square is 21.05, with four degrees of freedom, indicating statistical significance at $p < .0001$.
15. The difference between the age groups was statistically significant at $p = .000$, chi-square = 23.85, with two degrees of freedom.
16. The variables found to be significant in individual comparisons of enrollment in lottery-funded prekindergarten programs were entered into a logistic regression model to determine which factors predict enrollment. Although the model produced statistically significant estimates for each of the variables predicting the likelihood of a child attending a lottery-funded prekindergarten program, the overall fit of the resulting model was poor, and the results are not reported here.
17. Although the survey determined that more than one-fourth of HOPE scholarship recipients likely would not have been able to attend a postsecondary institution without the HOPE scholarship, the small number of respondents (181, or 23 percent of the sample) precludes performing analyses to determine statistical significance.

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Appendix: The Georgia Lottery Survey

Study #108
August 25, 2000

Hello, my name is [NAME], and I'm calling from the University of Georgia in Athens. The Survey Research Center is conducting a short study about people's opinions about issues and topics concerning the Georgia State Lottery, and I would like to interview a member of your household. Would you have a few minutes right now to answer a few questions?

[INTERVIEWER: THE SURVEY SHOULD TAKE ABOUT 10 MINUTES TO COMPLETE; THE STUDY IS BEING CONDUCTED FOR THE INSTITUTE OF GOVERNMENT AT THE UNIVERSITY OF GEORGIA FOR THE GEORGIA LOTTERY CORPORATION]

In order for the results of the survey to be representative of the state's population, I need to speak with the person who owns or rents the place where you live, who is at least 18 years old. Would that be you?

1. Yes [CONTINUE.]
2. No [MAY I SPEAK TO THE MALE/FEMALE HEAD OF HOUSEHOLD?] [REINTRODUCE YOURSELF AND THE STUDY OR ARRANGE FOR CALL-BACK AND GET THE RESPONDENT'S FIRST NAME.]

Thank you. Before we begin, let me assure you that all of the information you provide will be kept strictly confidential. The interview is voluntary, and if you don't want to answer any particular question, just tell me and we'll skip to the next one. Also, my supervisor may listen to part of the interview for quality control purposes.

To begin, I'd like to ask you a few questions about your participation in the Georgia Lottery.

Q1. The Georgia Lottery began in 1993. Have you ever purchased a ticket for any Georgia Lottery game within the past seven years?

1. Yes [CONTINUE.]
2. No [SKIP Q2–Q20, RESUME WITH Q21.]

7-Refused
8-Don't know
9-Not ascertained

Q2. Have you purchased tickets for the Georgia Lottery within the past year?

1. Yes [CONTINUE.]
2. No [SKIP Q3–Q20, RESUME WITH Q21.]

7-Refused
8-Don't know
9-Not ascertained

Q3. How often did you purchase lottery tickets during the past year? Would you say that you purchased lottery tickets every day, every week, every month, or several times during the year?

1. Every day
2. Every week
3. Every month
4. Several times during the year

7-Refused
8-Don't know
9-Not ascertained

Q4. What is your average weekly spending on lottery games? Would you say that you spend less than $10 a week, $11–20, $21–30, $31–40, $41–50, or over $50 per week?

1. Less than $10
2. $11–$20
3. $21–$30
4. $31–$40
5. $41–$50
6. Over $50

7-Refused
8-Don't know
9-Not ascertained

I am now going to read you a list of the various lottery games provided by the Georgia Lottery Commission. Please tell me which ones you have played during the past year. Have you played . . .

Q5. Instant Games (JUMBO BUCKS, LUCKY 7s)

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q6. LOTTO GEORGIA

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q7. The BIG GAME

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q8. PICK 3 or PICK 4

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q9. FANTASY 5

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q10. QUICK CASH (KENO)

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q11. On the average, how many lottery games do you play at a time?

_____ games

7-Refused
8-Don't know
9-Not ascertained

Q12. Have you ever won money playing the lottery?

1. Yes
2. No [SKIP TO Q14]

7-Refused
8-Don't know
9-Not ascertained

Q13. What is the largest amount of money you have ever won in the Georgia Lottery?

_____ dollars

6-$99,999 or more
7-Refused
8-Don't know
9-Not ascertained

Q14. Where do you usually purchase your lottery tickets? Do you purchase them at . . .

1. A neighborhood store
2. A store close to my work
3. Wherever I happen to be

7-Refused
8-Don't know
9-Not ascertained

Q15. Do you normally purchase other items when you buy a lottery ticket?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q16. Have you ever taken a cash advance from a credit card to purchase lottery tickets?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q17. Have you ever skipped or postponed purchasing something you needed or postponed paying a bill in order to purchase lottery tickets?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q18. Have you ever sought advice for winning the lottery by purchasing books, seeing psychics, or something else?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q19. Have you ever seen the people who sell you lottery tickets ask a ticket purchaser for proof of age when purchasing lottery tickets?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q20. Have you ever skipped going to a store in order to go to another store that sold lottery tickets?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q21. Have you ever skipped going to a store because of long lines for lottery ticket sales?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q22. Has anyone else in your household purchased any Georgia Lottery tickets in the past year?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q23. During the past year, have you participated in betting on horse races, dog races, sporting events, or casino gambling?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q24. Have you participated in any lottery or other gambling games on the Internet during the past year?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

I am now going to ask you a few questions about the educational programs provided by the revenue generated by the Georgia Lottery.

Q25. Are there any children in your household who attend or have attended a pre-kindergarten program?

1. Yes [CONTINUE]
2. No [SKIP TO Q31]

7-Refused [SKIP TO Q31]
8-Don't know [SKIP TO Q31]
9-Not ascertained [SKIP TO Q31]

Q26. How many children have attended at any time within the past five years?

_____ children

7-Refused
8-Don't know
9-Not ascertained

Q27. Was the pre-kindergarten program that the most recent child attended or is attending funded through the Georgia Lottery?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q28. Where did this child attend pre-kindergarten? Was it at a . . .

1. Public school
2. Private school or center
3. Church-affiliated program
4. Home school program
5. Other [SPECIFY: _____]

7-Refused
8-Don't know
9-Not ascertained

Q29. Did you enroll your child or children in pre-kindergarten so that you could work?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q30. Were you satisfied with the quality of instruction in the pre-kindergarten your child attended?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q31. Has anyone in your household ever received a HOPE scholarship for college or technical school?

1. Yes [CONTINUE.]
2. No [SKIP Q32–Q36, RESUME WITH Q37]

7-Refused
8-Don't know
9-Not ascertained

Q32. Did the most recent HOPE scholarship recipient attend a technical school, public college or university, or a private college or university?

1. Technical school
2. Public college or university
3. Private college or university

7-Refused
8-Don't know
9-Not ascertained

Q33. Did that person choose to go to college or technical school in Georgia rather than another state because of the HOPE scholarship?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q34. Would that person have attended a technical school or college without the HOPE scholarship?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q35. Did the HOPE scholarship recipient graduate, or is he/she still in school, or is he/she not currently taking classes?

1. Graduated
2. Still in school
3. Not currently enrolled

7-Refused
8-Don't know
9-Not ascertained

Q36. How many people in your household have received a HOPE scholarship?

_____ people

7-Refused
8-Don't know
9-Not ascertained

Q37. How many children in your household may be eligible for a HOPE scholarship when they finish high school?

_____ people

7-Refused
8-Don't know
9-Not ascertained

Q38. Did the existence of the HOPE scholarship program ever influence your decision to remain in Georgia or to move into Georgia?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q39. Has any high school graduate in your household ever been denied a HOPE scholarship because of his or her grade point average?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Some people favor state-sponsored lotteries and other people oppose state lotteries. Both sides have presented arguments to support their position. Please indicate whether you "agree" or "disagree" with each of the following statements regarding state lotteries.

Q40. The state lottery is a "hidden tax" on the poor.

1. Agree
2. Disagree

7-Refused
8-Don't know
9-Not ascertained

Q41. The state lottery is fair because every player has an equal chance to win.

1. Agree
2. Disagree

7-Refused
8-Don't know
9-Not ascertained

Q42. I would prefer to fund education programs with the Georgia Lottery rather than through additional taxes.

1. Agree
2. Disagree

7-Refused
8-Don't know
9-Not ascertained

Q43. All forms of gambling are morally wrong.

1. Agree
2. Disagree

7-Refused
8-Don't know
9-Not ascertained

Q44. If there was a referendum on the lottery in this year's election, I would vote for the continuation of the Georgia Lottery.

1. Agree
2. Disagree

7-Refused
8-Don't know
9-Not ascertained

Q45. Would you favor the continuation of the lottery if the revenue was used by the state for purposes other than education?

1. Yes, agree
2. No, disagree

7-Refused
8-Don't know
9-Not ascertained

Q46. Do you believe the HOPE scholarship program should allow all Georgia high school graduates to attend college or technical school, no matter what their grade point average?

1. Yes, agree
2. No, disagree

7-Refused
8-Don't know
9-Not ascertained

We're almost finished with the interview, but for statistical purposes I need to ask you a few questions about yourself. Again, all the information is confidential.

Q47. First, are you currently registered to vote in Georgia?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q48. About how many years have you lived in Georgia?

[INTERVIEWER: IF RESPONDENT SAYS, "All my life" or "I don't know," probe for exact number of years with "How many years is that," or "Could you give me your best guess?"]

_____ years

7-Refused
8-Don't know
9-Not ascertained

Q49. What is your age?

_____ years

7-Refused
8-Don't know
9-Not ascertained

Q50. What is your marital status? Are you married, separated, divorced, widowed, or single?

1. Married
2. Separated
3. Divorced
4. Widowed
5. Single

7-Refused
8-Don't know
9-Not ascertained

Q51. How many people, including yourself, live in your household?

_____ people

7-Refused
8-Don't know
9-Not ascertained

Q52. Do you own or rent your residence?

1. Own
2. Rent

7-Refused
8-Don't know
9-Not ascertained

Q53. What is the highest grade of school you have completed?

1. None
2. 1–8 years
3. 9–11 years
4. High school diploma or GED
5. Some college/technical school (no degree)
6. Two-year degree
7. Bachelor's degree
8. Some graduate work
9. Advanced degree, professional degree

10-Refused
11-Don't know
12-Not ascertained

Q54. And how would you describe your employment status? Are you currently employed, unemployed and looking for work, retired, a student, or a homemaker?

1. Employed
2. Self-employed
3. Unemployed, not looking for work
4. Unemployed and looking for work
5. Retired
6. Student
7. Homemaker

8-Refused
9-Don't know
10-Not ascertained

Q55. What was your approximate total household income (before taxes) last year? I don't need an exact figure, just an approximate category, so could you tell me if your total household income was above or below . . .

1. <$15,000
2. $15,000–$24,999
3. $25,000–$34,999
4. $35,000–$49,999
5. $50,000–$74,999
6. $75,000–$99,999
7. $100,000 or more

8-Refused
9-Don't know
10-Not ascertained

Q56. The state of Georgia provides Temporary Assistance for Needy Families (TANF). Has anyone in your household received any TANF benefits within the past year?

1. Yes
2. No

7-Refused
8-Don't know
9-Not ascertained

Q57. And finally, what race or ethnic group do you consider yourself to be a part of? [INTERVIEWER: DO NOT READ RESPONSES; CODE THE RESPONSE.]

1. White
2. Black (African American)
3. Asian
4. Hispanic
5. Multiracial [SPECIFY]

7-Refused
8-Don't know
9-Not ascertained

Q58. Gender? [RECORD GENDER, ASK ONLY IF UNSURE.]

1. Male
2. Female

9-Not ascertained

That completes the Georgia Lottery Survey. You have been very helpful, and we thank you for your participation.