

THE AGES OF LOTTO

Have younger people always matured to play more Lotto, or is their current lack of participation unprecedented?

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It is an observable fact that current players of classic lottery games like Lotto are mostly over the age of 45. This seems to be true no matter how we measure play - whether in dollars spent or in participation as measured in surveys. Among people who have only recently become old enough to play the lottery, participation and spending on the classic games is very low.

What does this mean for the future viability of these games? There two main schools of thought. The first is that extremely low participation among people who are now in their twenties and thirties will carry forward as these people age, while natural attrition will reduce the activity of those players who are now in their fifties and sixties; consequently the future of classic lottery games is bleak. Alternatively, people who are in their twenties and thirties will, as they age or mature, discover the appeal of these classic games and by the time they are in their fifties and sixties will support these games just as well as the current player population.

These two views lead to profoundly different ideas about what we should be doing in developing future lottery games. The first view leads us to urgently try to discover ways to make lottery games appealing to people who do not now participate. The second view leads us to focus on current customers, and give them more of whatever now seems to motivate them to play.

At the 2017 NASPL Professional Development Seminar held in Nashville, Tenn., these two views were briefly discussed among those who were fortunate enough to attend the very last research track session on the last day, and the question arose whether our enterprise data might speak in favor of one

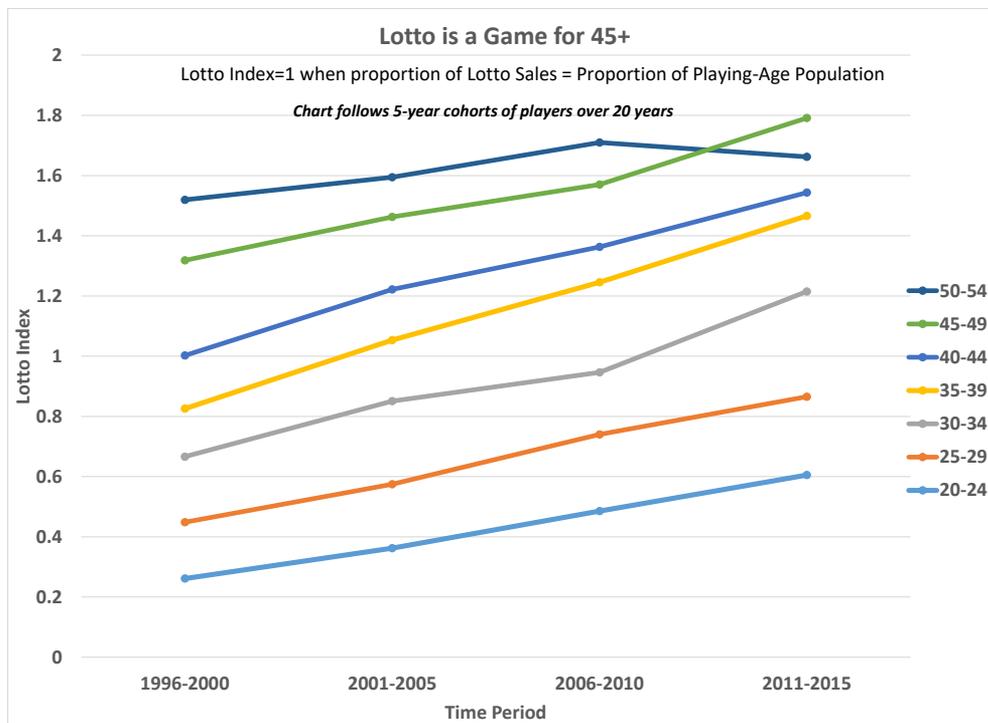
alternative or the other. Have younger people always matured to play more Lotto, or is their current lack of participation unprecedented?

As I will show in this article, the answer is "Yes." The "or" is nonexclusive. The younger age classes of twenty years ago did gradually increase their level of Lotto play as they aged, and the younger age classes of today are starting from a level of play around half that seen 20 years ago. This analysis supports hope but not complacency.

A big part of my aim here is to show how I used available data to address this question. All the information used here is from Washington State, and it is limited to one game. Other states may have more extensive data that could replicate, refute or extend what is shown here.

This analysis calls on two types of data: 1) year-by-year records of Lotto wins reported to the IRS by the lottery, and 2) year-by-year estimates of the population of the state, by age classes. Why only Lotto? Because only Lotto produced enough reportable (i.e. $\geq \$600$) wins each year, over a period of two decades, to support a breakdown of wins by age class. Most of these wins were due to a \$1,000 prize for matching 5 of 6 numbers. The value proposition of Lotto, while not constant over this whole period of time, has been recognizably consistent.

Now, concerning methods. Winning tickets are a random sample of all tickets, and the files that support IRS reporting normally reveal the age of the claimant. Consequently, the count of winning tickets by age relates to the level of Lotto play by people of that age. The range of ages is great (18-100), and the number of reportable wins in any year of operation



is modest (mostly 1,500-3,000). Consequently it makes sense to aggregate the win data to a few age classes, and likewise to group years of operation. Since the available population estimates were framed as 5-year age classes, I chose to aggregate the winning data to these same age classes, and to combine five years of lottery operation so as to represent 20 years of history in four periods of five years.

The data available to me allowed me to examine 20 years' worth of records, 1996 through 2015.

Do you remember 1996? If so, you may remember being younger then, and seeing lots of people around who were older than you. Now, probably, you see more people who are younger than you. People of about your age make up a certain share of the population, and that share may change over time. As it happens, people in the 20-25 age class have made up between 9 and 10 percent of the over-20 population of Washington in every year since 1996. People in the 60-64 age class, on the other hand, accounted for about 4.8 percent of the population in 1996 and have increased to 8.4 percent.

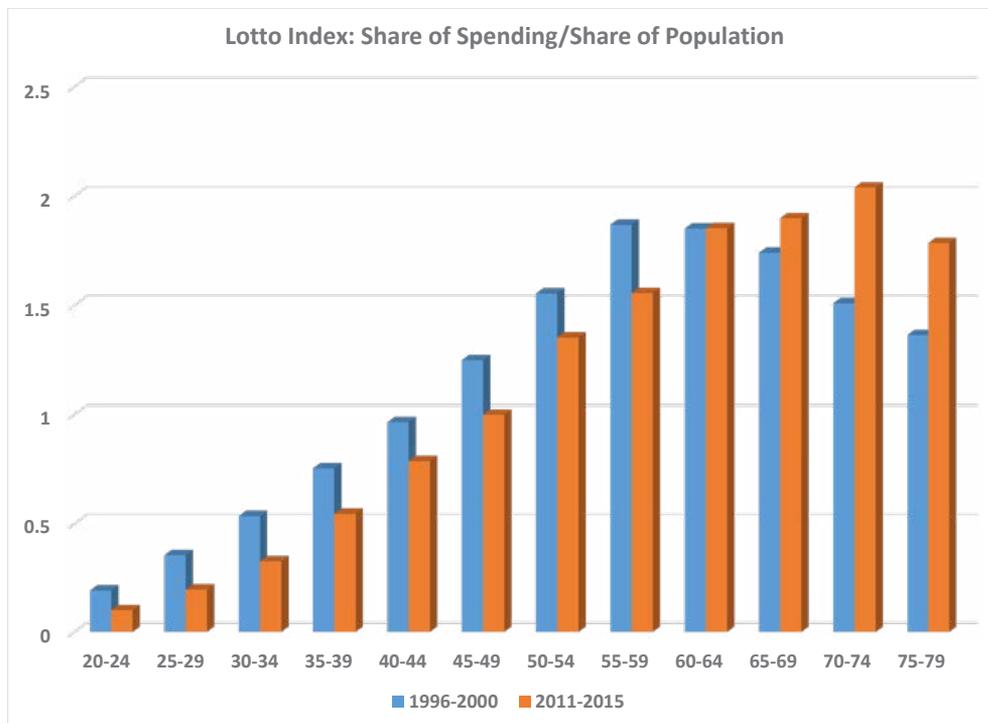
If, in any particular year, people played Lotto with the same intensity regardless of age, we would expect to see about 4.8 percent of Lotto spending attributed to the 60-64 age class around 1996, and about 8.4 percent of spending currently. That is to say, if age is not a factor in how people play Lotto, the proportion of play and the proportion of the population should be the same. In any one of our time periods, if we divided the proportion of Lotto play attributable to an age class by their proportion of the population, we would get a

result very close to 1. We might call this, just for this discussion, "the Lotto Index."

When we actually calculate the Lotto Index, we are not surprised to see that it is much greater than 1 for older, and much smaller than 1 for younger, age classes. This is just expressing quantitatively what we recognized already in the first paragraph of this article. The advantage of using this quantitative expression is that it lets us untangle the changing age structure of the population from people's changing behavior. If, as a group of people grows older, their Lotto Index increases, this is because they are playing with greater intensity than other age groups, not because they comprise a greater proportion of the playing-age population. Using this Lotto Index gives us a solid footing for looking at changes in behavior over decades.

In the first chart above, I show the Lotto Index for seven 5-year groups (cohorts) of people, starting with the period 1996-2000. The chart then tracks changes in the Lotto Index for these cohorts over three following five-year periods. The oldest age class in 1996-2000 is 50-54; those people are 70-74 years of age in the last period. I do not show an older age class in the first period, because I wish to avoid statistical instability that might arise as the cohort is depleted by natural mortality.

First, the situation at the start: Lotto was clearly a game for those 40 and over. People in the 40-44 age group accounted for precisely the same share of Lotto sales and of the potential player population, so their index was 1. Those who were older played harder and had a higher index, those who were



younger played less, to the extent that those who were 20-24 spent about one quarter as much, on a per-person basis, as the 40-44 year olds.

Now, revisiting these same groups in the next five year period: everyone is older and everyone is playing relatively more. This is possible because of people not belonging to the seven age groups tracked here: the over-20 population of potential players has been expanded by new people coming of age and playing little, and some of the oldest people are playing less. This trend of increasing share of play continues for each cohort with the sole exception of those who were age 50-54 in 1996: the youngest of these reached 65 in the last period, and their share of play declined.

To summarize this story about some of our “current” (2011-2015) players: each age cohort has accounted for an increasing share of Lotto play over the years. Those who reached ages 35-39 in this last period had a Lotto Index of 0.60, having started as 20-24 year olds with an index of 0.26. Those who reached ages 50-54 in the last period, with an Index of 1.47, started as 35-39 year olds with an index of 0.82. But notice: while in 1996-2000 the 35-39 year olds had an index of 0.82, current 35-39 year olds had an index at 0.60. That is, people who are currently in this age class account for a smaller share of Lotto play than people who were in this age class 20 years ago.

The second chart focuses on this kind of comparison, bringing in data from more age classes both in the 1996-2000 period and in 2011-2015. Unlike the first chart, this one does not follow cohorts through time, but simply averages over all those belonged to an age category over a period of five years. What has changed? Two notable things: the more recent distribution is shifted to the right by 5 to 10 years, and the right tail runs off the chart, indicating more intense Lotto play

by people in their 70s.

This chart does tend to tie in with other things we know about changes in the working world: young people are getting “real” jobs later and starting families later, and old people are working longer. The lottery world can no doubt adjust to these changes, if that is all that is happening.

On the other hand, another way to look at this right-shift is that the people who are in their seventies now are playing much like they did at their peak of engagement, 15 to 20 years ago. If people who are now in their fifties have hit their peak of engagement and maintain in the same way, we will see lower spending 20 years out.

Still another ominous sign is that the age differential in playing intensity – that is, the index of the most-active cohort divided by that of the least-active – doubled from 1996-2000 to 2011-2015. In 2011-2015, the most active cohort played 20 times harder than the least active.

Further, only an optimistic view assumes those who are now represented by the tiny orange block on the left will follow in the path of their elders. There is nothing in this review of recent history that speaks to whether those on the younger side of the “digital divide” will behave like those on the older side. The youngest age group in Chart 2 mostly includes mostly people who graduated high school between 2005 and 2009. The development of their lottery play as they mature will tell its own story, and it may not follow the pattern suggested by the next older group.

In summary, I have not settled this very interesting question about the future of classic lottery games, but I hope I have outlined a way of analysis that may be useful, as we try to use the data generated by our business to understand what is developing. ■