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Notes Contributing Editor

Education Notes bring mathematical and educational ideas forth to the CMS readership in a manner that promotes discussion of relevant topics including research, activities, issues, and noteworthy news items. Comments, suggestions, and submissions are welcome.

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As detailed in previous columns, more recent developments in the United States of America have fundamentally shifted my relationship with said country. I also mentioned that Education Notes would be dedicated to Canadian (much more than American) mathematics education matters. This particular column, however, is about the Super Bowl; and, as we all know, the Super Bowl is bigger than America. So, with my sporty little caveat out of the way, I wish to note three moments from Super Bowl LX where – Spoiler Alert – the Seattle Seahawks beat the New England Patriots.

The first moment to note was a rather bizarre cutaway shot that took place with a few minutes left in the game. A cutaway shot, in television parlance, is a complementary shot of something, away from the main action to show details or provide further context. In a movie, for example, a cutaway shot might zoom in on an actor's cheek to highlight a tear indicating an emotive response to a conversation between two individuals. In Super Bowl 60, one shot that really caught my attention was the stirring of the Gatorade during the final few minutes of the game. Stirring of the Gatorade?! Ridiculous.

No doubt, Gatorade powders and concentrates are cheaper than premixed Gatorade. However, I'm happy to go out on a limb and argue that the National Football League (NFL) can afford premixed Gatorade. NFL revenue in 2024 exceeded \$20 billion, for example. Even if the NFL is all about using Gatorade powders and concentrates for some bizarre reason, you think they'd splurge on premixed Gatorade for the Super Bowl, and especially for the Gatorade to get dumped on the winning coach. To the victor goes the spoils.

The cutaway shot to stirring premixed Gatorade gets curiouser and curiouser, until gambling gets stirred into the mix. Believe it or not, one of the biggest bets placed during the Super Bowl is the color of the Gatorade that gets dumped on the winning coach. Yellow/Green/Lime received much action this year which, arguably, was related to many thinking Seattle would win the big game and that Yellow/Green/Lime would pair nicely with the "Action Green" accents on the navy coloured jerseys and pants of the Seahawks.

The purpose of the cutaway shot to an unnecessary stirring of Gatorade, then, was to remove all doubt regarding the color of the liquid about to get dumped on coach Mike Macdonald. In the past, the Gatorade bath hasn't always gone well. There are many moving parts on an NFL sideline, and the colour of the Gatorade shower can be hard to discern. Last year, the lighting of the stadium and other factors necessitated that the winning coach clear up the confusion swirling as to whether he was doused with Orange or Yellow/Lime/Green Gatorade.

What the quick cutaway shot truly tells me is that (1) gambling's grip on the NFL is stronger than ever, and (2) the extremely high production value associated with NFL football games is being extended to gambling. In general, the different elements comprising the high production value of a NFL football game (e.g. slow motion instant replay, the Spidercam/Skycam system, cameras in the orange touchdown posts, "hidden" microchips in the football, etc.), are used to remove doubt in the game and help enforce the rules (e.g., was that a catch, were they in bounds, did the ball cross the plane or the first down marker, etc.). The Gatorade cutaway demonstrates that NFL television production is now willing to point its lens on the massive, massive legal industry that is NFL gambling. Removing doubt in gambling on the game is important, too.

There are two other moments that indicated, to me, that the high production value of televised NFL football is being utilized for gambling purposes. For example, this year, it was extremely clear when Charlie Puth clearly finished singing the national anthem at Super Bowl LX. All in one shot was the sequence of the seven flyover planes (one big one in the middle) passing over the stadium, Charlie with his mouth clearly shut indicating to all the anthem is over, silent back-up singers and then another flyover plane for good measure. From a television production standpoint, an important shot and not an easy one to pull off. Important because of previous controversy surrounding the over/under of the national anthem performance.

If gambling on Gatorade isn't your thing, maybe you are interested in placing a bet on whether the singing of the national anthem will go, say, under 2 minutes in length or over 2 minutes in length. A simple bet or so it would seem. In the past, sportsbooks were stuck paying out both sides of the bet due to timing and other discrepancies, which, for them, is not ideal. For example, Jon Batiste, last year, had a very protracted final note which had some saying the anthem went under a particular amount of time and others saying that it went over. By way of another example, Gladys Knight took it upon herself to repeat the word "brave" in her rendition of the anthem many years ago, which resulted in some sportsbooks paying out both sides of the bet. Thanks to one shot, it was clear, this year, when Charlie was done with the anthem and there would be no paying out both the over and the under by any sportsbook. Here again, high production value associated with televised football gets utilized for clearing up potential gambling grievances.

The last moment I will mention is the coin toss. In football, the coin toss takes place no more than three minutes before kickoff. That's the rule. The captain of the visiting team calls "heads" or "tails" (also the rule) and then the referee or a designate tosses a coin at the center of the field. The winner of the toss (according to the rules) is granted certain benefits like choosing which end of the field they wish to defend and whether they kick off or will receive the kick off or whether they wish to defer their choice to the second half. Honestly, there is a lot going on with Article 2 (Toss of Coin) of Section 2 of Rule 4 of the NFL rulebook.

Things are much less complicated from a gambling perspective when it comes to the coin toss: heads or tails. As in previous years, the Super Bowl provides an opportunity to, you guessed it, bet on the coin toss before the game. One sportsbook, this year, denoted the coin toss as the "Flip of Destiny" and provided even odds on the coin landing heads (-104) or tails (-104). In other words, if you bet \$104 on the coin landing heads then you would lose \$104 if the coin landed tails, but you would win \$100 if the coin landed heads. Similarly, then, if you bet \$104 on the coin landing tails. A simple bet that garners much attention and action during the Super Bowl.

It sounds silly now putting it in print, but I am and have always been interested in the coin toss at the Super Bowl. I am interested in the running history of the coin toss, and peoples' thoughts on the ever changing ratio, streaks of heads or tails in a row, the curse, and the toss itself. I am also interested in the coin. I am drawn to what constitutes "heads" and "tails" for the coin. Typically, one side has the Super Bowl name and logo, and the "reverse" side has the names and logos of the teams playing in the game. As such, I am always drawn to what the referee deems as "heads" and "tails" for the coin prior to the flip. My interest also lies in the toss of the coin by the referee because, according to the rules, if the coin does not flip, that is, turn over in the air (which I think I've seen), or is compromised in any way (which I also think I've seen) then the Referee shall toss it again (which I haven't seen) and the original call may not be changed. It is at this point, at the very peak of my interest in the Super Bowl, the coin toss, that the otherwise extremely high production value of televised NFL football fails.

In the past, once the "heads" and "tails" of the coin are presented by the referee, the camera shot typically pulls back for an action shot of whomever is flipping the coin and then quickly pans back to the faces of the referee and the captains. Once back into a tight shot of the faces, the referee notes which way the coin landed, whether the visiting team has lost or won the toss and all the other related information about kicking or receiving the ball and which direction teams will play. Important information, for sure, but this bothers me immensely.

The few camera shots that I am truly interested in, especially when it comes to the Super Bowl coin toss, I never get. First, I want a shot of the entire coin toss and evidence of the result. As mentioned, NFL rules indicate that if the toss is compromised "in any way" then the Referee shall toss it again. What, then, counts as a compromised coin toss? I would also like a shot of the coin sitting on the grass. In the past, we took the referees word that the one side with all the logos on it, as opposed to the other side with all the logos on it, has been correctly identified. Let's not forget that this is also the biggest stage in the world for the referees, which means that it is not out of the realm of possibility that a nervous referee could incorrectly identify tails as heads or heads as tails. Not showing the coin, I guess, provides a level of plausible deniability; however, if the latest Super Bowl is any indication, which showed precisely when the anthem was over and the colour of Gatorade, things are going the other direction. If we're going to borrow certain aspects of the high production level of televised football in order to eliminate doubt regarding gambling outcomes then, pardon the pun, let's go all in, especially on the coin toss.

This year, try as I might, I was unable to establish whether the person flipping the coin started their toss with the coin heads up or tails up. I tried to follow the pass of the coin from the hands of the referee to the hands of the coin flipper, to no avail. There are a few ways this issue (of mine) could be rectified. First, the camera could have zoomed in closer to the coin just as it was about to get tossed. This would have eliminated any guessing associated with the "Flip of Destiny" starting heads or tails up. The camera did take a moment and zoom in on the coin laying on the field to eliminate any doubts regarding whether the coin landed heads or tails, but I had already forgotten which side was heads and which was tails. I know, I know, this all sounds absurd, but no more absurd than fake stirring premixed Gatorade, especially to those adhering to and espousing particular philosophical interpretations of probability

Alternatively, and it'll sound even more absurd, the NFL could embed the same type of chip they put in the football (which is used to determine "exact" yardage on those too close to call plays) into the coin. Stay with me here. Having a chip in the coin would help eliminate any doubt as to whether heads was heads or tails was tails. It would also help with making sure that the coin has turned over in the air or was compromised in any way. See, unlike the national anthem and unlike the Gatorade dumped on the winning coach, the coin toss is part of the game. The coin toss is found in the NFL rulebook (Rule 4 and Rule 16), but it is also a popular wager with high-stakes action (e.g., one person wagered a quarter of a million dollars on "heads" this year), which means that it lives as part of the game and part of gambling on the game, which is a dicey area. The level of scrutiny applied to all other rules of the Super Bowl must be applied to the coin toss, I contend.

The Super Bowl coin toss is one of the most famous coin flips in the world. The history of the coin toss is already being written (e.g., historical results, streaks, curses, etc.). As one of the most popular bets of the Super Bowl, the coin toss will draw more attention and more scrutiny going forward, which provides an opportunity to hear from those ascribing to different philosophical interpretations or probability. I'm not saying that the individual that bet a quarter of a million dollars on the coin toss this year read "Dynamical Bias in the Coin Toss" by Diaconis, Holmes and Montgomery in SIAM Review, but I am saying there's a chance.

Whether you're a propensity theorist or a frequentist, or perhaps you ascribe to the other side of the coin when it comes to philosophical interpretations of probability, Kseniya and I would love to hear your thoughts on the Super Bowl coin toss. Just give us a heads up!