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Abstract

Part of the draw of athletics is its straightforwardness. There are nuances to competitions to make them more sporting contests, but at the end of a long jump competition whomever records the longest jump should win. Unfortunately, a recent rule-change at the highest level of the sport – the “Final 3” format – undermined this simplicity for the horizontal jumps and the throws for some of the 2020 and much of the 2021 seasons. While fortunately this rule was largely reverted within days of the initial submission of this paper, it's still valuable to critically evaluate why such a rule is problematic so as to better understand of the value of sporting competitions and give guidance on future rule changes, be they in athletics or other sports. To that end, we will be drawing from the literature on the purpose and value of competitions and coupling that with simulations based on data from actual top-tier long jump competitions to show that the Final 3 format makes for significantly worse competitions than the standard format.

Keywords: sport, competition, athletics, long jump

Abstract

Parte del atractivo del atletismo es su franqueza. Hay matices en las competiciones para que sean más competiciones deportivas, pero al final de una competición de salto de longitud, quien registre el salto más largo debería ganar. Desafortunadamente, un cambio de reglas reciente en el nivel más alto del deporte, el formato "Final 3", socavó esta simplicidad para los saltos horizontales y los lanzamientos para algunas de las temporadas de 2020 y gran parte de 2021. Si bien afortunadamente esta regla se revirtió en gran medida a los pocos días de la presentación inicial de este documento, sigue siendo valioso evaluar críticamente por qué tal regla es problemática para comprender mejor el valor de las competiciones deportivas y dar orientación sobre futuros cambios de reglas, ya sean en atletismo u otros deportes. Con ese fin, aprovecharemos la literatura sobre el propósito y el valor de las competiciones y la combinaremos con simulaciones basadas en datos de competiciones reales de salto de longitud de primer nivel para mostrar que el formato Final 3 hace que las competiciones sean significativamente peores que el formato estándar.

Palabras clave: deporte, competición, atletismo, salto de longitud

I will have no interest in the long jump until they stop that ridiculous format.
– Carl Lewis, 9-time Olympic Gold Medalist (2021)

1. Introduction

To the uninitiated, an event called the Long Jump would obviously be won by the competitor who records the longest jump. To make the event more exciting and more skills-testing, one might expect that competitors would get multiple attempts to jump, both so that luck doesn't play an outsized role in the competition and to add tactical decisions to the competition. Such an event could be a fantastic test of athletic skill as well as terribly exciting for spectators. But if you agree with this, then you clearly are not a deciding factor in World Athletics, the governing body for international Athletics.¹

Enter “The Final 3.”

Starting in 2020, the Diamond League – the premier international athletics circuit – changed the format for the throws and horizontal jumps in dramatic fashion. Rather than letting all competitors take their standard allotment of six throws or jumps, with the winner being whomever records the longest throw or jump, the Final 3 format gives the victory to whomever records the best mark in only the final round. Further, as the name suggests, only the three athletes in the top-three positions after the fifth round get this final opportunity. The result is a competition where an athlete can dominate throughout a competition, notching the five best jumps throughout the first five rounds, but still finish third without any other competitor approaching those top marks.

Despite fierce opposition by athletes, World Athletics and the Diamond League decided to implement this format change during the 2020 season. This decision seemed to be made solely with the impact on spectators in mind, rather than on the integrity of the competition. According to World Athletics, this change was made “to better promote the field events in an action-packed two-hour schedule and give them their own stand-alone moments of focus and drama.” (Athletics Weekly 2020) The Diamond League celebrated the change, saying it

¹ World Athletics was recently known as the International Association of Athletics Federations, but rebranded in 2019. It had previously been known as the International Amateur Athletic Federation, though rebranded in 2001 when even they couldn't pretend that international Athletics was an amateur affair.

would add “drama, jeopardy and excitement for stadium spectators and the millions of television fans around the world.” (Wanda Diamond League 2020)

Many athletes have voiced their concerns since the change took place, not least of all four-time World Outdoor Champion, three-time World Indoor Champion, and 2012 Olympic Champion Brittany Reese, who refused to compete at any Diamond League meet until the old format is restored. (Reese 2021) The Athletics Association – an independent organization for international athletics – put out a press release slamming the change and noting that approximately 87% of surveyed athletes disliked the new format. (The Athletics Association 2021) Olympian and twice African champion Ruswahl Samaai won the first Diamond League meet to use this new format, but that did not make him a fan.

I won the competition based on a format that’s not fair towards the guy with the furthers [sic] distance. Our event is simple. Whoever jumps the furthest during the competition wins the competition but not this time around. 8,13m gets you second place and 8,09m wins the competition. (Samaai 2020)

Fans and other athletes take to social media seemingly after every Diamond League meet where this format leads to a change in what the “correct” finishing order should be. This itself makes a case that World Athletics is doing a poor job “to better promote the field events.” While the outcry from athletes and fans should have been enough to determine that this format change was a dismal failure by World Athletics, we can be more explicit about how this change to the Final 3 is bad for the sport as a competition.

In the following section, we’ll look at the philosophy of sport literature to better understand what makes for more meaningful competitions in general and why the Final 3 format undermines good competition. Following that, we’ll illustrate the changed nature of field events under the Final 3 format by looking at simulations using real, top-level Long Jump competition data from 2010 to 2019. (While the Final 3 applies to all throws and horizontal jumps, we’ll be focusing on the Long Jump for purposes of this paper.) We will conclude that this format, and others relevantly similar, are harmful to the sporting purpose of competition and that any future rule changes ought to take guidance from the literature on good competitions.

2. Sporting competitions

Sport is many things, but if nothing else it is a contest between athletes to test particular athletic skills. As Robert L. Simon puts it, “competition in athletics is best thought of as a mutual quest for excellence through challenge.” (Simon 1985, 10) Sigmund Loland says that,

[i]n spite of great diversity in sport-specific goals, then, it is possible to formulate a general goal that characterizes sport competitions as such: the goal of sports competitions is to measure, compare, and rank two or more competitors according to athletic performance. (Loland 2002, 10)

Sport competitions are not simply about winning a competition, but rather about who is better in that particular sporting competition. As Nicholas Dixon explains,

we can easily find undeserved victories in which this purpose is not achieved—in other words, contests in which the player or team that wins is not, according to both our intuitions and plausible accounts of the goal of competitive sport from the philosophy of sport literature, better than the losing player or team. ... For brevity’s sake, I will at times refer to such events as “failed athletic contests,” meaning contests that have failed in their central comparative purpose, even though they may have succeeded in other goals like entertaining spectators. (Dixon 1999, 10)

Following Simon, we can understand this view of sport as the Skill Thesis. “According to the Skill Thesis, competitive sports contests are tests of the competitors’ skills designed to determine which opponent is more skillful in the sport being played.” (Simon 2007, 13)

A better understanding at what Long Jump competitions test and how they do so will illustrate why a Long Jump competition following the new Final 3 format is a less good competition and more likely to lead to “failed athletic contests” than a standard format Long Jump competition.

Many skills, including but not limited to speed, accuracy at the board, explosiveness, and body control during flight are tested during each attempt in a Long Jump competition. Additionally, an athlete’s skill in measuring their energy throughout a competition is also tested, especially when competitions take place in more draining weather conditions. Similarly, tactical skills about when to take bigger risks or be cautious – depending both on the athlete’s own series and those of competitors – are oftentimes important.

While there are some traditional Long Jump competitions where an athlete has a string of bad luck or just-off-the-mark attempts, the traditional format makes it far less likely that this will play the deciding factor in the results relative to the Final 3 format. In a traditional eight-athlete Long Jump competition, each athlete gets six attempts, with the jumping order

reset into reverse-standing order after both the third and fifth rounds.² The overall ranking of the athletes is determined by the best jump in their series, whatever round it came in. (In cases of a tie in athletes' best jumps, the tiebreaker is their second-best jump.) In the Final 3 format, only the top three in the standings get to take the sixth jump after the second reordering. The standings of the top three in the competition overall are determined by this final jump, rather than the best jump in their series as is the case for the traditional format.³ Given this extra importance on one round of jumping, both luck and hitting an attempt just right play an especially big role in the Final 3 format.

Luck plays a role, to varying degrees, in all sporting competitions. In the Long Jump, this largely plays out with the wind. Even a small change in wind speed or direction can subtly impact an athlete's speed, pushing them just over the board for a foul or too far from the board so that they give up precious centimeters. There are of course other ways that luck can play out in a competition as well, from the fans not quite getting the requested rhythm for the run-up clap to unexpected noises of celebration from elsewhere around the track.

Nothing said here is to imply that luck impacting competitions is necessarily a bad thing. Luck can enhance the excitement of a competition. Depending on the sort of luck at issue, it can fit nicely with the Skills Thesis view of competition. For example, an athlete who has honed their skill of feeling wind velocity and adjusting their approach accordingly will be able to navigate the luck of swirling wind conditions better than their competitors. In general, an athlete may be especially skilled in dealing with any number of lucky or unlucky events that occur during the competition. However, while luck might be part of the game, in the Final 3 format it plays an especially big role in the final standings. A moment of bad luck in the Final 3 format can spell disaster, whereas one unlucky attempt in the traditional format needn't be terribly significant for an athlete given they have five other attempts for a top finish.

² Some larger competitions, including championship competitions, start with 12 athletes and then trim the field down to eight athletes after the third round. While a full discussion of this format (or other possible formats) is beyond the scope of this paper, there are two important distinctions between this larger field format and the Final 3 format that makes the Final 3 format more problematic from the point of view of trying to test who has the best competition. First, the Final 3 format impacts those at the top of the standings, rather than at the bottom. Second, the Final 3 format determines the final placings with only one attempt, whereas even those cut when the field is trimmed have three attempts.

³ Ties in the final round are determined by jumps in the preceding five rounds.

Even more importantly than how luck can impact the results of a competition is the likelihood of athletes getting attempts just right. Even the best and most consistent jumpers do better or worse on various parts of their attempts, from their speed to their accuracy to their explosiveness at the board, etc. This is what makes the sport exciting; if every athlete always jumped their absolute best, then the results of each competition would be determined before the competition began. The ability to be spot on for all phases of a jump is certainly a skill to be tested in the long jump, but given the variations we see between attempts in jumps it will take more than one attempt to determine who is the better long jumper that day, as opposed to simply who had a better attempt in that particular round.

In a paper discussing flaws in the game structure of a competition, R. Scott Kretchmar (2005) discusses how allowing for more “skillful interchanges” – opportunities to perform the relevant skills of that competition – makes it more likely that the better team wins. Reducing the number of skillful interchanges has the result of making competitions more up to chance, and so less likely to be a meaningful test in lines with the Skills Thesis. While there are still six attempts (for the top three) in the Final 3 format, once the top three advance they’re down to one, rather than six, skillful interchanges relevant to their podium positions. While Kretchmar’s theoretical discussion works well with his simple example where one wins and the other loses a skillful interchange, we’ll need a much more detailed example for our Long Jump situation. We now go trackside to show how our worries about the Final 3 format significantly changing the likelihood of victory are justified.

3. Simulated Competitions

To show how meaningful this rule change is, we’ve run simulations using real data from top-tier Long Jump competitions to demonstrate the differences in results from a typical Long Jump format to the Final 3 format. While there is more nuanced data analysis that could be done to fully understand the differences in these formats, and although we exclusively looked at the Women’s Long Jump for our data analysis, the below should be sufficient to illustrate our concerns about the Final 3 format.

3.1 Data Source and Preparation

First, we gathered every jump attempt in the Women’s Long Jump in the Diamond League from its debut in 2010 to the last pre-pandemic year of 2019. We then identified the

eight athletes with the largest number of jump attempts. These athletes are Tianna Bartoletta, Janay DeLoach, Funmi Jimoh, Darya Klishina, Shara Proctor, Brittney Reese, Ivana Španović, and Lorraine Ugen. We then entered these athlete's marks from Diamond League competitions, including fouls, into a spreadsheet. This gave us a sample of 1,149 jumps from which we could draw for our simulations.

3.2 Simulations

A single simulated Long Jump competition consisted of eight athletes performing six jumps each. In each simulated competition, each athlete's marks were drawn at random from their real marks. Marks were drawn with replacement, meaning that each new draw was made from all possible marks. Once each athlete had six marks, including fouls, we determined the medalists for each simulated competition under the two different rule sets.

This process was conducted 1,000 times, resulting in a number of medals for each athlete over the 1,000 competitions. To avoid our results being influenced by random chance in any one set of 1,000 simulated competitions, we conducted the exercise of simulating 1,000 competitions 1,000 times. This resulted in a distribution of the number of medals for each athlete. These distributions are plotted in the Results section below.

3.3 Results

To compare the rule sets, we counted the number of gold, silver, and bronze medals won by each athlete over each of the 1,000 iterations of 1,000 simulated competitions, under each rule set. This produced a dataset for each athlete that allowed us to calculate the difference between the number of each medal won under the different rule sets. This produced a central tendency of those differences, i.e. a median value, as well as the spread of the differences around that central tendency. These results are shown in Figures 1-4 as boxplots. The dark line in the middle of each box represents the median value and the upper and lower ends of the boxes represent the 75th and 25th percentiles, respectively. Vertical lines on the boxes end at 1.5x the interquartile range above and below the boxes, and the dots represent observations outside that range, i.e. outliers.

Figure 1. Percent of competitions in which an athlete medaled under the different rule sets.

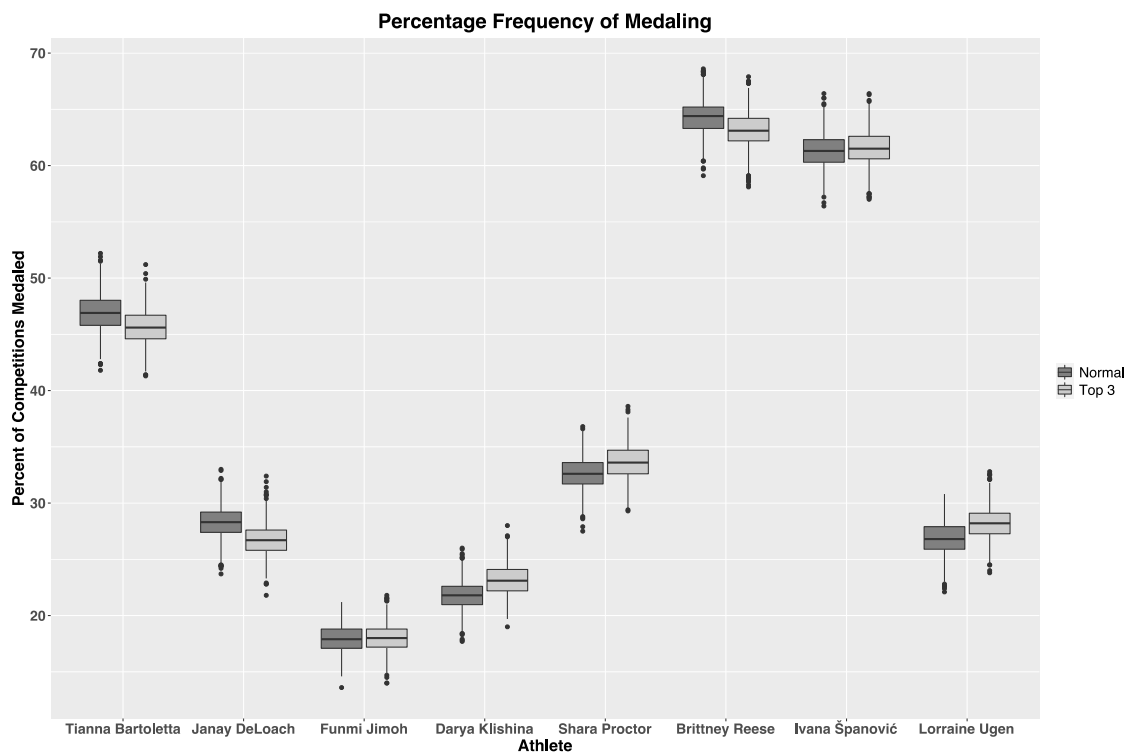


Figure 1 shows us that although there are some differences in how often each athlete might medal under the different rules sets, for the most part each athlete would medal at approximately the same frequency. This makes sense, because the Final 3 format would only be expected to produce different medalists compared to the normal format if an athlete in 4th-8th place managed to improve to 1st-3rd place in their last jump under the normal format.

However, Figures 2-4 show that which athlete earns which medal varies widely based on the different formats. A set of exploratory regression analyses identifies that average jump distance, jump distance standard deviation, and frequency of faulting all meaningfully impact who wins what medal. This is somewhat intuitive – an athlete that faults 1/3 of the time but has a very high average jump distance may regularly make it into the top three, but once into the top three would very often win bronze under Final 3 rules due to a fault on the final jump despite having the longest jump in the competition and winning gold under the normal rules. Conversely, an athlete that does not jump as far but is very consistent in their jump distance and rarely faults may be able to win silver and gold more often in Final 3 as others fault or fail to perform well.

Figure 2. Percent of competitions in which an athlete won gold under the different rule sets.

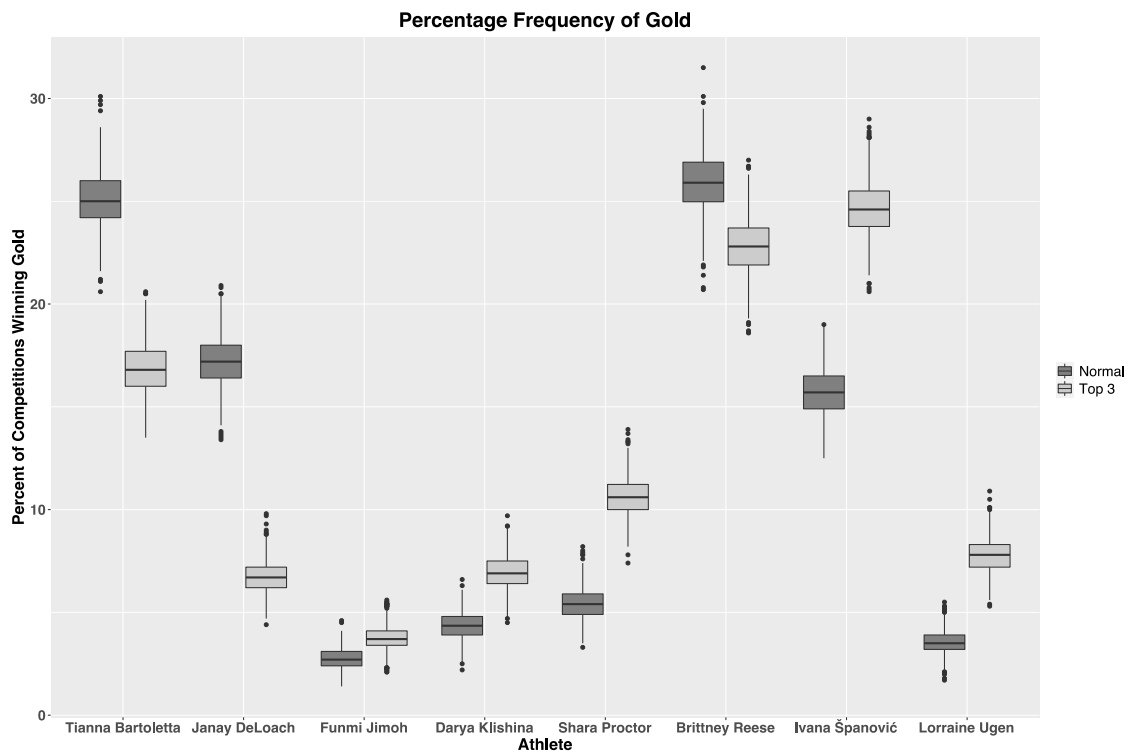


Figure 3. Percent of competitions in which an athlete won silver under the different rule sets.

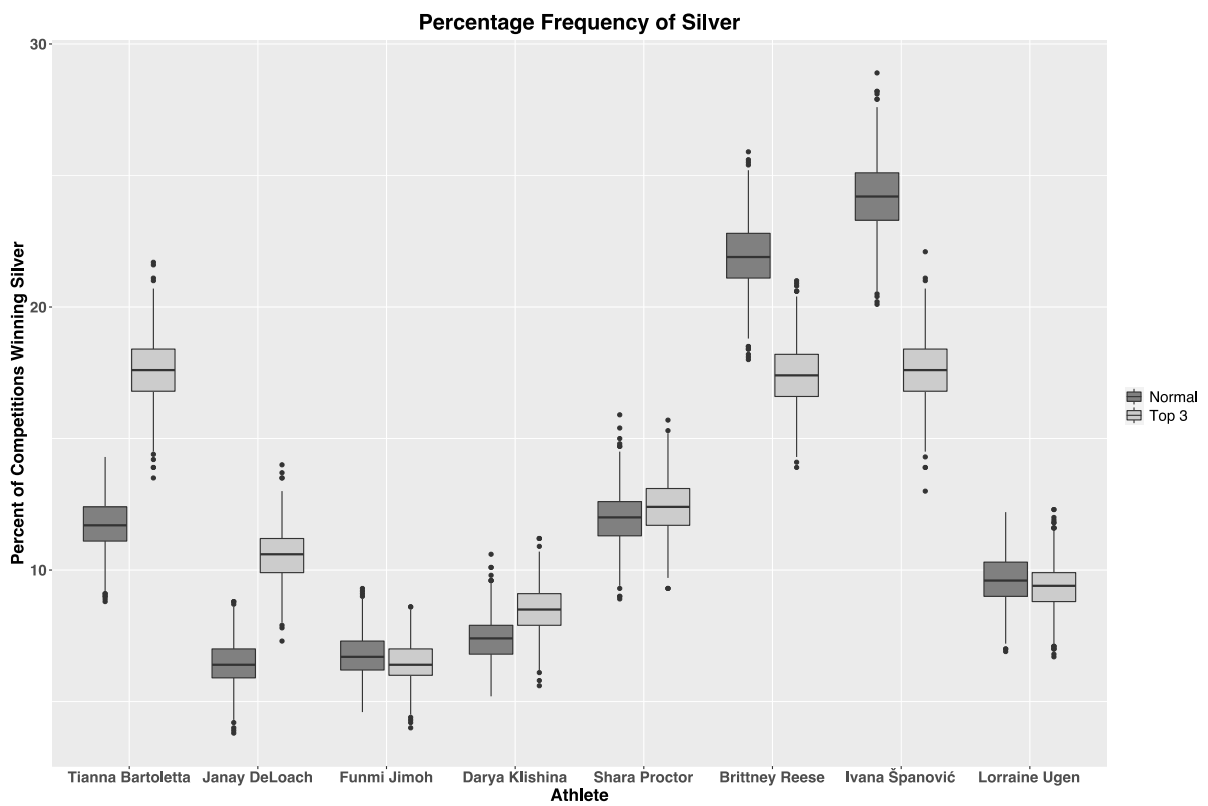
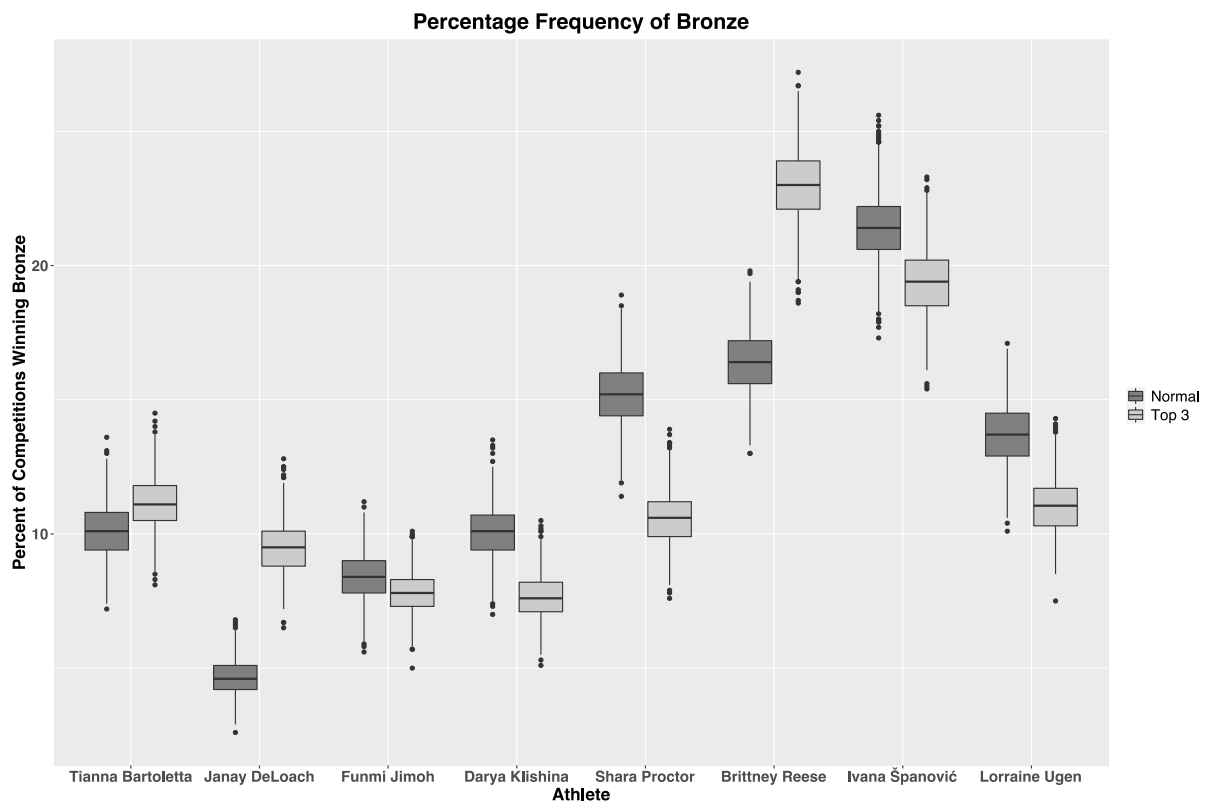


Figure 4. Percent of competitions in which an athlete won bronze under the different rule sets.



3.4 Discussion

The general take-home of the simulations is that while Final 3 does not much change who is likely to medal, since 5/6th of the competition is already complete by the time the rule difference comes into play, it does change dramatically who wins what medal. A shortcoming of our analysis is that under real competition circumstances there is some strategy that determines how much effort an athlete puts out on a given jump or how conservative they are in their jump (which influences their likelihood of faulting), and this strategy would change under the Final 3 rule set. Our analysis assumes that the athletes treat every jump the same. However, 1,000 competitions of six jumps each simulated 1,000 times is likely sufficient to overcome any shortcomings with respect to strategy for present purposes. It is unlikely that the essential finding – that the Final 3 format fundamentally changes the medal distribution between the athletes – is subject to strategy to such a degree as to invalidate it.

4. Conclusion

The athletes were right to oppose this Final 3 rule change. And fortunately, within days of this paper's initial submission for publication, World Athletics saw the error in its ways and announced they would massively revise the Final 3 format for the 2022 season, doing away with the "clean slate" in the final round (although the new format is not quite back to the original). (Wanda Diamond League 2021) While this particular error has been largely corrected, our investigation above is nonetheless important to show how philosophically guided investigations into sport can have meaningful impacts on acceptable rule changes, both in this specific case and as a warning ahead of any other changes that might be introduced down the line. To hammer home the impacts of such misguided changes that can occur when decision-makers don't think about the integrity of the competition, we will conclude by rescoring the Women's Long Jump at the Olympics since 2000 using this new format.

In 2000, Heike Dreschler won with 6.99, Fiona May was second in 6.92, and Tatyana Kotova was third in 6.83. Were the Final 3 in effect, Kotova would have won with her 6.73 final jump, one centimeter beyond May, with Drechsler third due to a final foul.

In 2004, Tatyana Lebedeva won with 7.07, Irina Simagina was second in 7.05, with Tatyana Kotova third by countback also with a best of 7.05. Were the Final 3 in effect, Kotova would have won due to being the only athlete to record a legal jump in the final round, with Lebedeva second and Simagina third.

In 2008, Maurren Higa Maggi won in 7.04, Blessing Okagbare was second in 6.91, with Chelsea Hammond third in 6.79. However, there is an additional complication this year. The athlete who finished in second on the day was Tatyana Lebedeva, who was later banned for an anti-doping violation and had her results cleared. Were the Final 3 in effect, Lebedeva would have been one of the three to take the final jump, meaning that only two non-banned athletes would have taken the final jump, and as such it is unclear how World Athletics would determine the reallocation of medals. This is compounded by the fact that neither of the other two athletes who would have earned a final jump, Maggi and Okagbare, recorded a legal sixth attempt, while the athlete who was fourth on the day but was elevated to third, Hammond, did record a legal mark. Given this, the new results under the Final 3 format

would seem to have Maggi first, Okagbare second, and Hammond third (as is the case in actuality), despite in reality only Hammond recording a final mark in an attempt she would not have had if the Final 3 were in effect!

In 2012, Brittney Reese won with 7.12, Yelena Sokolova was second in 7.07, and Janay DeLoach was third in 6.89. Were the Final 3 in effect, Sokolova would have won as the only athlete to record a final mark.

In 2016, Tianna Bartoletta won in 7.17, Brittney Reese was second in 7.15, and Ivana Španović was third in 7.08. If the Final 3 were in effect, Reese would have won with her 7.15 in the final round, with Bartoletta (7.13) second and Španović (7.05) third.

In 2021, Malaika Mihambo won in 7.00, with Brittney Reese second in 6.97 and Ese Brume third also in 6.97. If the Final 3 were in effect, Mihambo would still have won as her 7.00 came in the final round, with Brume taking second (6.90) and Reese (6.84) finishing third.

There are all sorts of changes we could try to make athletics more spectator friendly. We could make ample use of split screen, so fans can actually watch everything that's going on. We can stop cutting to commercial during competitions, something that – to the best of our knowledge – no other spectator sport regularly does. We could make sure that access to athletics broadcasts is easily accessible to all, and actually advertised to future fans. And when it comes to the field events, we could – and the authors recognize that this is a radical proposal given the status quo – actually show the entire competition as it unfolds.

It is good that World Athletics largely scrapped this absurd Final 3 version for field events. Nonetheless, this investigation should serve the broader purpose of illustrating how philosophical investigations into competition design can be valuable to decision-makers and the broader sports world. And most of all, it should be a reminder to trust the athletes themselves and to not try to overcomplicate the world's greatest sport.⁴

⁴ We leave proof of the greatness of athletics as an exercise for the reader.

Acknowledgements

This paper is dedicated to all the field event athletes who saw their event insulted by the powers that be in our sport. We may be distance runners, but we appreciate you.

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