Presents

The Jump Manual

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NOTICE: *This document is long and detailed. If you want to receive the same information in video form with examples, **please sign up at Skating Jump Secrets** and we'll let you know when the videos are ready. If you've already signed up, we hope to have them ready for you shortly.*

CONTENTS

INTRODUCTION

This Manual was created as a response to an online survey. The survey results indicated that figure skating coaches disagree about fundamental and basic ideas regarding the jumps. This lack of consensus is very eye-opening. In order to help give this topic some much needed exposure, I created the website Skating Jump Secrets.

Coaches have many reasons for not agreeing on the fundamental mechanics of skating jumps. Figure skating is passed on from one generation to the next via word of mouth, from coach to skater. There is very little in the way of written instruction, and what does exist is generally confusing and contradictory. As discussed in Video #3 at *Skating Jump Secrets*, even the rules do not provide a clear written description of each of the jumps.

Coaches generally teach the jumps the way they were taught. So even though new techniques have been developed, many old and out-dated ideas regarding jump mechanics and basic technique continue to survive. The fact that the written rules are vague, contradictory and out-dated adds to the confusion.

It's sad that skaters anywhere in the world should have to learn poor jump mechanics based on out-dated teaching methods. It's particularly sad because elite coaches that have developed efficient jump mechanics have been sharing their ideas for decades.

I contend that without a common fundamental starting point, the confusion and lack of consensus within figure skating will continue, perhaps indefinitely. Without a general agreement of what the basics are, coaches that currently teach sub-optimal technique can always justify not changing their approach.

I've written this report to begin a discussion that will help us reach a consensus in our sport. Experts in other sports snicker at the lack of consistent teaching methods in figure skating. And nearly everyone, whether they're involved in skating or not, is shocked to learn that the rules for skating jumps are so confusing.

The purpose of this document is to propose a starting point for a new set of written rules for skating jumps. This proposal could be used to create new rules, but more importantly, this document can be used by coaches everywhere to start developing a consensus regarding proper jump mechanics. By banding together, coaches can create a set of "unofficial" rules that will allow consistent teaching methods to be developed and promoted.

I consider this document just a start for this process. Much work needs to be done. If you're passionate about figure skating, I hope you'll lend your opinion to the upcoming discussions. Thank you for your interest in this report and I hope it helps your skating or coaching!

The concepts in this report were developed by watching hundreds of hours of jump video. My opinions and observations have been shaped by hundreds of other coaches. I am grateful to all coaches that share ideas and develop systems for teaching skating jumps.

A huge thank you goes to Gary Strangman who taught me how to skate. I'm also indebted to Laurie Johnson-Kreuger and Tina Chen for shaping my early skating experiences. I'm especially grateful to Jann Hull, whose focus on the technical details of proper jumping had a huge influence on my own coaching interests and style. Jann was mentored by Diane Miller, and I'm a big fan of Diane's teachings. I'm also thankful to Oleg Vassiliev for teaching me pairs, and showing me how to truly skate across the ice. And I'm particularly grateful to Audrey Weisiger for being my mentor and sharing such amazing knowledge. With my re-born interest in video analysis, I'm super grateful to Chris Conte for all his insights, data, and support. I'd also like to thank Sheila Thelen for her enthusiastic support of my websites. This list would not be complete without a thank you to Tricia Offerdahl for all the things I've learned while working with her. And most importantly, I'd like to thank my wife Laura for her endless support and patience for my "projects."

I'd also like to thank the hundreds of coaches that have been so supportive of my efforts at *Skating Jump Secrets*. Without you, this journey would not be worth taking.

Chapter 1

WHERE DO WE START?

As discussed in the videos at *Skating Jump Secrets*, there's a significant difference between the written rules and what's passing for clean jumps today. Which is correct? On one hand we have the written rules that are largely ignored. On the other hand we've got the efficient jump mechanics that everyone agrees "looks right."

It turns out that the efficient jump mechanics that top coaches have developed over the years are necessary for skaters to perform triple and quadruple jumps. Very few female skaters if any have ever rotated 3 or more full rotations in the air to perform a clean triple lutz as suggested by the rules. Video evidence supports this claim.

Additionally, these efficient jump techniques are accepted by judges and technical panels in competitions. The concept of a forward loop jump take-off may go against the rule book, but judges and technical panels have no reservations about giving it full credit.

So we have two options.

1. We can enforce the current written rules, or
2. We can alter the rules to reflect what everyone accepts as clean jumps.

The first option isn't very appealing. Much of the jump mechanics developed by top coaches over the last 60 plus years would have to be thrown out. Judging would become very difficult until coaches, judges and technical panels could learn what the new technique "looks like."

It makes much more sense to update the written rules to match what top coaches are teaching their skaters and what judges and the public expects in terms of clean jumps.

The rest of this document is devoted to identifying and specifying what is currently accepted in terms of jump mechanics.

Chapter 2

WHAT'S ACTUALLY HAPPENING?

How has this situation persisted for so long? How can the rules be so out of synch with the practical application of the sport? And how come this hasn't come up before.

The answer to this question is somewhat complicated.

First and foremost, as I described in Video #3 at *Skating Jump Secrets*, top coaches have been completely aware of this situation for years. But for a variety of reasons discussed in Video #3, they have elected not to push for a change in the rules or even to expose the current situation.

But now, with the availability of inexpensive digital video cameras and low cost video analysis software, coaches around the world are beginning to dissect the jumps like never before. It's the new tools that are allowing coaches to have a clear understanding of what's really going on. Previously these tools just weren't practically available to most coaches.

By digitally capturing the performances of elite athletes and analyzing the jumps in these performances, it's possible to create a list of characteristics that can be used to create a new set of rules or guidelines.

The recommendations in the remainder of this manual were created by observing hundreds of double, triple and quadruple jumps, frame by frame.

Chapter 3

THE LANDING

Before we get to specific jumps, it's very important to have a consensus regarding what constitutes a "clean" jump landing. The written ISU rules are somewhat confusing since they do not provide a formal definition of any of the terms they use.

In the document *ISU First Aid For Technical Controllers and Technical Specialists* under Jump Clarifications, they use the terms "¾ mark landing" and "quarter mark of landing" but unfortunately these terms are not defined. Apparently for a jump to be considered cheated "there needs to be more than ¼ revolution missing." It is not stated from what the ¼ revolution is missing.

In any case, I'd like to propose a very precise rule for clean jump landings based on well-defined physical principles. But first, here's some important background information.

Have you ever rolled a ball (without spin) on an absolutely flat surface? You know that the ball will roll straight. Once it's rolling, it will continue rolling in that direction until something stops it or pushes it off its path. Over time it will slow down due to friction but it will continue to go in a straight line if the surface is flat and the ball is perfectly round.

Now let's consider tossing a ball. If we don't throw the ball too fast or with too much spin (so we can ignore air resistance), the ball will fly on a nice arc when seen from the side. But the ball will trace out an absolutely straight line over the ground. Where you throw the ball is where it goes.

More technically, if we can ignore aerodynamic effects (air resistance), the center of mass of any object (including a figure skater) will fly in an absolutely straight line over the ground (or ice) from take-off to landing.

This characteristic allows us to create a very precise definition of a clean jump landing. Here we are using the term "flight path" to describe the straight line over the ice from take-off to landing. Additionally, because the skate blade lands gliding backward, we use the convention that when a skater lands completely backward, the skate is gliding in the same direction as the flight path. (Put another way, when a skater lands completely backward, the skate in the opposite direction of the flight path.)

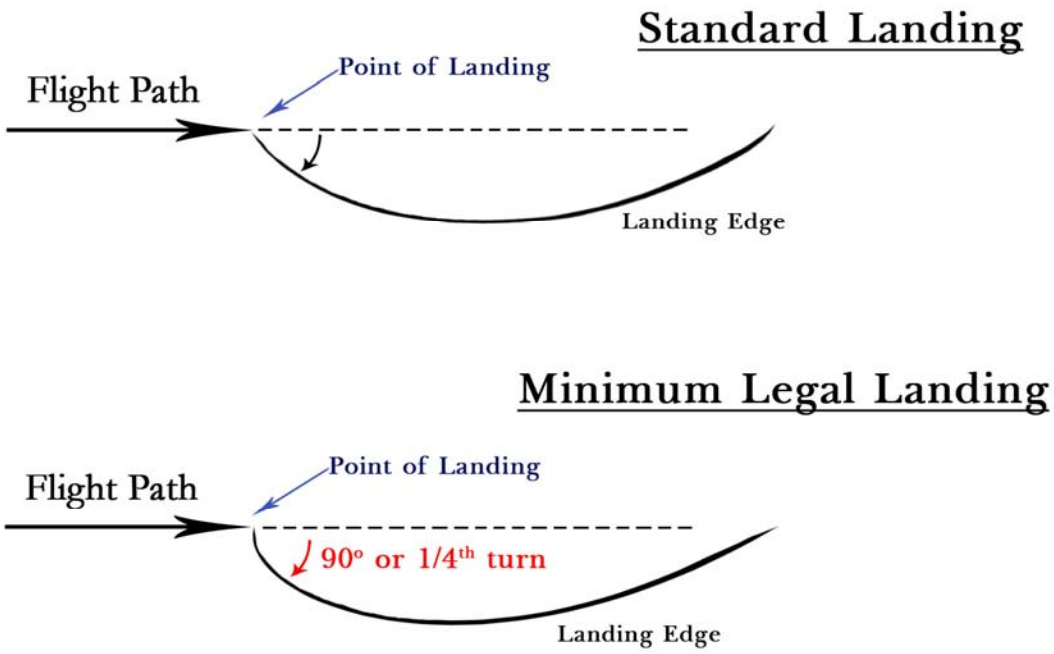
Here's my recommended definition of a clean jump landing.

"A clean jump landing is a landing where the skater's blade touches down a maximum of 90 degrees short of the flight path. The flight path represents the straight line over the ice from the jump take-off point to the touch down point."

That's it.

It's important that coaches stop referring to clean jump landings that have the minimum allowed rotation on landing as "a quarter turn cheated." Many coaches use this terminology for a legal jump that would not be downgraded, but is 90 degrees short of the flight path. A jump that is cheated by a quarter turn is really a jump that is landed with the skate blade facing in the same direction as the flight path (totally forward). Recommended terminology for jumps with the minimum legal rotation at landing should be "a quarter turn short of the flight path."

Here's a diagram of the proposed rule:



Please realize that nowhere am I claiming that a landing that satisfies the minimum rotational requirement is superior to a landing that is clean and lands "more backward." All of the total minimum rotation information provided in this report for each jump is based on these minimums. Obviously, in most cases having some additional rotation may be beneficial to get smooth flowing landings.

Chapter 4

THE TAKE-OFF

Before addressing the individual jumps, it's important to get a few definitions and concepts out of the way. First and foremost, jumps are defined by the take-off edge they use.

As we'll see, that information by itself has led to tremendous confusion among coaches. For example, a loop jump is commonly said to "take-off from a back outside edge." But this terminology lacks precision.

A better description is a loop jump is "entered from a back outside edge." In this description, I'm not talking about the variety of entrances a skater can use to set up the loop jump. I'm just talking about the final edge that creates the energy for the jump.

In the case of the loop jump, this edge also creates the rotation for the jump. We refer to this as "natural rotation" because it is natural to rotate in the same direction as the entry edge.

But the lutz rotates in the opposite direction as the entry edge. The traditional terminology for this has been "the lutz jump rotates in the counter rotational direction."

These definitions of rotational direction will suffice, and no change to the existing terminology is suggested.

"A jump rotates in the natural rotational direction when it rotates the same direction as the entry edge. A jump rotates in the counter rotational direction when it rotates in the opposite direction as the entry edge."

Chapter 5

THE "EDGE" JUMPS

The edge jumps consist of salchow, loop and axel. These jumps all lift off the skate that defines the entrance edge. A brief history of each jump and an "informal" working definition are provided below. The salchow and loop have a back entrance edge while the axel has a forward entrance edge.

There are two major misconceptions regarding the edge jumps.

The first misconception applies to all three "edge" jumps. This misconception is that these jumps lift off a clean edge. Although they can lift off a clean edge, the majority of elite skaters perform these jumps by actually jumping off their toe pick.

From the perspective of efficiency, this makes complete sense. To get maximum height, it is logical that a skater would engage the calf muscles, thereby pointing the toe at take-off and lifting off the toe pick. It is very difficult to jump without pointing the toes.

It also makes sense that a skater would jump off the toe pick for stability. It is very difficult to learn the precise timing required to press off a clean edge under control. That's because the force at take-off must be applied exactly perpendicular to the edge, or the skate will move during the powerful push. If the skate moves, some of the energy of the jump is lost to the skate movement and the skater must reduce the force or the skate will move even further.

So taking efficiency and stability into account, it is logical that edge jumps should actually lift off the toe pick. And indeed, that is how most elite skaters do it and how most top coaches teach it.

The second misconception applies to the back entrance edge jumps, salchow and loop. This misconception is that these jumps must take off backward. Although they can take off with the skater not facing the direction of flight, the majority of elite female skaters perform these jumps by taking off facing forward.

From the perspective of efficiency, again this makes sense. Why not actually turn forward before lifting off to reduce the amount of rotation required in the air? At first glance that may seem like cheating, but it has been accepted as standard practice by top coaches as well as judges and technical panels.

It also makes sense based on what actually happens at take-off. As discussed previously, most elite skaters lift off the toe pick in a salchow or a loop. They enter the jump on the correct edge and at the "place of take-off," they completely stop their skating motion by performing a tiny three-turn on the ice and immediately pressing the toe pick into the ice. Thus, they turn partially forward during the three-turn and this creates an image on the ice that many coaches refer to as a "flag." After the tiny three-turn, most skaters continue pivoting on the toe pick until they are totally forward just before they lift off the ice.

The technique as described above has been universally accepted by judges and technical panels, and a majority of elite coaches teach the jump this way. As stated above, a forward take-off is not required, but it is more efficient and therefore more desirable for most skaters. Many male skaters do not take off completely forward. But that's usually because they can jump so high that they don't need to maximize their efficiency.

It's interesting that so many coaches still teach that a loop and a salchow should lift off a clean edge while skating backward. One of the major goals of this report is to help coaches realize what makes an efficient edge jump take-off.

Those responsible for creating the formal rules will need to address how far beyond forward a skater may turn and still get credit for the jump. This concept of a cheated jump take-off is mentioned in the existing rules, but the rules do not provide any precise definitions as described in Video #3 at *Skating Jump Secrets*. The rules will also have to address how much of the forward edge will be allowed just after the tiny three turn just before take-off. Some may argue that no forward edge should be allowed, but a way to enforce this may not be available. All rules should be written with the precision to allow slow motion and frame by frame review.

Many coaches have questioned whether the original "edge" jumps took off from a clean edge. As of the original release of this manual, I don't know. According to an About.com article on Ice Skates, the toe pick was invented for figure skating by American skater Jackson Haines in the 1870's. This was before any of the edge jumps were first performed according to the written histories. The closed toe blade design common today was first invented in 1914.

Salchow

According to Wikipedia, the salchow was invented by Ulrich Salchow of Sweden in 1909. It is unclear if the original salchow used a clean edge take-off.

Today a salchow that gets full credit in competition can be defined as:

Salchow: a jump entered on a back inside edge, turning in the direction of natural rotation, and landed on a back outside edge of the other skate. The take-off may be forward (with blade facing the flight path) and the jump may lift off the toe pick of the skating foot.

The minimum rotation for a single salchow is ¼ rotations in the air. The minimum rotation for a double salchow is 1 ¼ rotations in the air. The minimum rotation for a triple salchow is 2 ¼ rotations in the air. The minimum rotation for a quadruple salchow is 3 ¼ rotations in the air.

Loop

According to Wikipedia, the loop jump was invented by Werner Rittberger in 1910. The name "loop" is based on the compulsory figure that it vaguely resembles. Again it is unclear if the loop jump was performed off a clean edge when it was invented.

Today a loop that gets full credit in competition can be defined as:

Loop: a jump entered on a back outside edge, turning in the direction of natural rotation, and landing on a back outside edge of the same skate. The take-off may be forward (with blade facing the flight path) and the jump may lift off the toe pick of the skating foot.

The minimum rotation for a single loop is ¼ rotations in the air. The minimum rotation for a double loop is 1 ¼ rotations in the air. The minimum rotation for a triple loop is 2 ¼ rotations in the air. The minimum rotation for a quadruple loop is 3 ¼ rotations in the air.

Axel

The axel was invented by Norwegian skater Axel Paulsen. According to Wikipedia, he first performed the jump in 1882.

No other jump evokes the emotional response of the axel. The axel is a major milestone for most aspiring skaters. And well it should be. As we'll see, the difficulty of an axel is significantly higher than any other single jump. And a double axel is a right-of-passage for all top skaters.

It's very important to understand how most skaters perform double and triple axels. Many coaches still consider an axel to be just a waltz jump with an extra rotation. But slow motion video analysis clearly shows that double and triple axels exhibit important differences when compared to the waltz jump.

A waltz jump usually takes off a shallow clean edge with a firm toe pick impression at lift off. The skater's flight path is roughly in the same direction as the final take-off edge direction.

But the axel edge just before take-off is somewhat different. A typical axel edge continues to get deeper just before take-off so that the angle between the final take-off edge direction and the flight path is more pronounced. In fact, the edge deepens so much that many skaters skid off the edge into the take-off.

On most good double and triple axels, the angle between the final blade position at take-off and the flight path is approximately 90 degrees. A very high percentage of skaters performing double and triple axels use a skid entrance that also has roughly a 90 degree angle between the final blade position and the flight path.

So if the skate blade rotates through 90 degrees before lift-off and can legally land a quarter turn short of the flight path, then an axel can rotate as little as 1 revolution in the air. Most (if not all) written descriptions of the axel incorrectly claim that the jump rotates 1 ½ times in the air.

Here's a working definition of an axel:

Axel: a jump entered on a forward outside edge, turning at least 1 full revolution in the air in the direction of natural rotation, and landing on a back outside edge on the other skate. The jump take-off may lift off the toe pick. The desired blade angle just before lift-off should not exceed 90 degrees to the flight path.

The minimum rotation for a single axel is 1 rotation in the air. The minimum rotation for a double axel is 2 rotations in the air. The minimum rotation for a triple axel is 3 rotations in the air.

The axel can be performed with yet another technique that currently also gets credit as a clean jump take-off. Most judges, coaches and spectators would say this axel technique is "poor." But poor or not, it works for many skaters. And more importantly, as of the time this report was written, it counts in competition.

As a coach I struggled with whether or not to put this information in this report. I think we should foster "good" jumps and not "poor" ones. In the end, I decided to put it in because the discussion may prove useful to coaches and judges trying to understand the difference in the techniques.

In this alternate "poor" technique, the skater enters the axel as before but in an attempt to get into the rotational position earlier, the skater spins through the take-off so that when their blade actually leaves the ice, it's facing directly away from the flight path. As I said above, these jumps almost always get credit for a clean take-off. However, they are almost always penalized by the judges with a low GOE using IJS or a low score in 6.0.

In any case, the minimum total rotation in the air for this "poor" axel is only ¾ of a revolution. This jump is considered clean by virtually all judges and technical panels but usually gets penalized for having "poor" quality.

If we were going to create an axel definition that includes "poor" axels it would be:

Alternate axel definition: a jump entered on a forward outside edge, turning at least ¾ of a revolution in the air in the direction of natural rotation, and landing on a back outside edge on the other skate. The jump take-off may lift off the toe pick. The blade angle just before lift-off shall not exceed 180 degrees to the flight path.

For this definition, the minimum rotation for a single axel is ¾ rotations in the air. The minimum rotation for a double axel is 1 ¾ rotations in the air. The minimum rotation for a triple axel is 2 ¾ rotations in the air.

Keep in mind that this currently gets credit and does not get downgraded but it does get penalized by judges as being lower quality.

Chapter 6

THE "TOE" JUMPS

The toe jumps consist of toe loop, flip, and lutz. The entrance edge defines these jumps and they all lift off the toe pick of the other skate. As such, these jumps require a complete transfer of weight from the skating foot to the picking foot before take-off. A brief history of each jump and an "informal" working definition are provided below. All the toe jumps have a back entrance edge.

There are two major misconceptions regarding the toe jumps. The first misconception is that the toe pick may not rotate or pivot on the ice. The second misconception is that the toe jumps must take off backward.

The origins of these beliefs are difficult to pinpoint. But it seems likely that these two myths have remained alive partly because they are so strongly related. If the skater must take off backwards, then the toe pick cannot pivot on the ice. And if the toe pick is not allowed to pivot on the ice, then the jump has no way to get forward so the take-off must be backwards.

That's circular reasoning (and should be avoided).

In reality, toe jumps today are getting full credit with very high execution scores (GOE) for pivoting forward on the toe pick at take-off. The vast majority of female skaters performing triple toe jumps take off facing forward. This is very easy to show using slow motion video. And many elite coaches teach their skaters to pivot on the toe pick while maintaining internal rotation of the hips, allowing them to get forward at the moment of take-off.

Of course, it is not required that the skater pivot on the toe pick during a toe jump. And a forward take-off is also not required. In fact, most elite male skaters do not pivot forward on flip and lutz. Instead they open their hips to get through the jump during the spring into the air and then immediately close the hips to get to the rotational position.

But judging by the numbers of elite female skaters that pivot forward on toe jump take-offs, the forward take-off appears to be more efficient. Will we start seeing more quads than just the salchow and toe loop if male skaters start adopting the efficient techniques used by the ladies?

What's important for this analysis is that a forward toe jump take-off with the skater pivoting on the toe pick currently gets full credit from judges and technical panels.

Before addressing each of the toe jumps individually, it's worth noting that the historical terminology of "toe assisted" take-off is unfortunately poor wording that confuses most young skaters. In reality, essentially 100% of the skaters weight is transferred to the toe pick prior to take-off on toe jumps. This makes the picking foot and leg the primary driving force for the jump. It is illogical to consider the primary driving force merely an "assist." It will help young skaters as well as young coaches to change the terminology to something like "complete weight transfer" as in the definitions below.

That leads to our working definitions of the toe jumps.

Toe Loop

According to Wikipedia, the toe loop was invented in the 1920's by American professional show skater Bruce Mapes.

Today a toe loop that gets full credit in competition can be defined as:

Toe Loop: a jump entered on a back outside edge of skate A with a complete weight transfer to the toe pick of skate B prior to take-off, turning in the direction of natural rotation, and landed on a back outside edge on skate A. The take-off may be forward (facing flight path) and the toe pick may turn on the ice.

The minimum rotation for a single toe loop is ¼ rotations in the air. The minimum rotation for a double toe loop is 1 ¼ rotations in the air. The minimum rotation for a triple toe loop is 2 ¼ rotations in the air. The minimum rotation for a quadruple toe loop is 3 ¼ rotations in the air.

This discussion would not be complete without some discussion of the "toe waltz jump" or "toe axel." Sadly, a number of coaches also refer to it as the "adult toe loop" as a large percentage of adult skaters attempting toe loops perform the jump in this manner. I encourage all adults to learn the jump properly and coaches to stop referring to it by that name.

Based on the existing definitions, a toe axel is technically a double toe loop as it still has a complete weight transfer from the back outside edge to the picking foot. However, in the toe axel during the weight transfer the skater prematurely closes the hips while the skating foot is still well behind the toe pick. The skater then swings the free leg through much like an axel or a "poor" axel as described above.

In general, toe axels are easy to spot. But it is still unclear if these jumps are being downgraded or given credit. We know for certain that judges are not giving these jumps high execution marks.

To eliminate the toe waltz jump or toe axel, perhaps we need to add the following to the toe loop definition:

The blade of skate A must not rotate past 90 degrees to the flight path before passing (along the direction of the flight path) the toe pick mark of skate B.

Although this definition needs further study and development, it at least gets people thinking about it and hopefully will help eliminate the pesky toe axel. At the very least a formal definition of what constitutes a toe axel should be developed and skaters performing a toe axel should only get credit for an axel and no credit in jump combinations where the toe axel is performed as the second or third jump.

Flip

According to Wikipedia, it is not clear who invented the flip, which is sometimes referred to as a toe salchow. By the 1930's it was performed regularly.

Today a flip that gets full credit in competition can be defined as:

Flip: a jump entered on a back inside edge of skate A with a complete weight transfer to the toe pick of skate B prior to take-off, turning in the direction of natural rotation, and landed on a back outside edge on skate B. The take-off may be forward (facing flight path) and the toe pick may turn on the ice.

The minimum rotation for a single flip is ¼ rotations in the air. The minimum rotation for a double flip is 1 ¼ rotations in the air. The minimum rotation for a triple flip is 2 ¼ rotations in the air.

As discussed above, the vast majority of female skaters performing triple flips actually pivot to forward on the toe pick just before lifting off into the air. Some elite coaches teach their female skaters to maintain internal hip rotation during the weight transfer to the toe pick, thereby forcing the pivot on the toe to the forward take-off position.

Most male skaters on the other hand still perform the jump by planting the toe pick solidly into the ice and opening their hips through the take-off. Their toe pick does not turn on the ice. Due to their extra strength, they can use this technique to jump higher than most women are capable of. Although the men sacrifice initial rotational position and speed, they make up for it in jump height, allowing them to complete the rotations at a later time before touching down.

It should be noted that there are a handful of very athletic female skaters that also perform a triple flip the way most men perform it, but it appears most female athletes must use the more efficient pivot-on-the-toe-pick method.

Lutz

According to Wikipedia, the lutz was named after Austrian skater Alois Lutz who performed the jump in 1913.

Today a lutz that gets full credit in competition can be defined as:

Lutz: a jump entered on a back outside edge of skate A with a complete weight transfer to the toe pick of skate B prior to take-off, turning in the counter rotational direction, and landed on a back outside edge on skate B. The take-off may be forward (facing flight path) and the toe pick may turn on the ice.

The minimum rotation for a single lutz is ¼ rotations in the air. The minimum rotation for a double lutz is 1 ¼ rotations in the air. The minimum rotation for a triple lutz is 2 ¼ rotations in the air.

Just as in the discussion above for the flip jump, the vast majority of female skaters performing triple lutz actually pivot to forward on the toe pick just before lifting off into the air. Again, some elite coaches teach their female skaters to maintain internal hip rotation during the weight transfer to the toe pick, thereby forcing the pivot on the toe to the forward take-off position.

Just like the flip, most male skaters perform the jump by planting the toe pick solidly into the ice and opening their hips through the take-off. Their toe pick does not turn on the ice. Again they are capable of using this less efficient technique because they are stronger and can jump higher. Some very athletic female skaters also use this technique.

Final Thoughts on Toe Jumps

The discussion on toe jumps would not be complete without some mention of the most controversial aspects of these jumps.

The most controversy appears to surround the “flutz” which is really just a flip that the skater intended to be a lutz. But a similar argument can be made for skaters that intend to perform a flip and inadvertently perform a lutz instead. Admittedly, the number of skaters performing a flutz is much higher than those performing an unintended lutz instead of a flip.

In the flutz, the skater starts on a back outside edge but switches the edge prematurely before picking and jumping. This is very common as many skaters have trouble generating the counter rotation of a lutz from the outside edge. By switching to an inside edge prior to take-off they get to use natural rotation which is much easier.

In the less common "flip-turned-into-a-lutz" the skater usually performs a rocker instead of a three turn to get to the entrance edge which is now an outside edge. This error is much less common than the flutz but some skaters find the lutz take-off to be more stable and more powerful. This is especially true of skaters that have difficulty controlling the inside edge or controlling their hip positions during the pick placement and weight transfer while on an inside edge.

The real question is what should be done about these errors and how the rules can address them. Currently the technical panel is charged only with identifying "obvious cases" of edge change violations. No specific rules are cited.

The problem is what's obvious to one person is not always obvious to another person. In reality, the "obvious cases" rule is not beneficial to the sport because coaches have no way to measure if their skater will get credit or not.

Here are two alternatives for dealing with these issues:

1. Set a very specific distance and radius for the allowed edge change. For example, if the outside edge of an attempted lutz changes to an inside edge of a certain radius more than a certain distance before the skate leaves the ice, the jump would be called a flip. All flip and lutz entrances could be subject to video review. Some serious research and discussion needs to take place select the actual numbers.

This suggestion would help maintain the integrity of the flip and lutz. Coaches could easily measure for themselves if their skaters fall into the problem area by looking at the tracing on the ice during practice. Setting a precise and clear expectation for coaches and skaters may be the most important aspect of setting the rule this way.

2. The second alternative is truly a radical proposal that I've only heard recently. In this proposal, the flip and lutz would be made interchangeable and would be combined into a single jump for judging purposes. This proposal would effectively kill the harder lutz jump as virtually nobody would bother to learn it properly. Because of this, I don't support this proposal at this time.

But this latter proposal brings up a very important topic. There's actually another toe jump that has essentially vanished over the years. That jump is the toe walley.

Toe Walley: a jump entered on a back inside edge of skate A with a complete weight transfer to the toe pick of skate B prior to take-off, turning in the counter rotational direction, and landed on a back outside edge on skate A. The take-off may be forward (facing flight path) and the toe pick may turn on the ice.

The minimum rotation for a single toe walley is ¼ rotations in the air. The minimum rotation for a double toe walley is 1 ¼ rotations in the air. The minimum rotation for a triple toe walley is 2 ¼ rotations in the air.

Historically, most (all?) skaters attempting a triple toe walley were switching their entrance edges from inside to outside well before the weight transfer to the toe pick, thus actually performing a standard toe loop. As such, the rules currently consider the toe loop and toe walley to be completely interchangeable. I've never seen video of an actual triple toe walley.

Here's some food for thought. In reality, the toe walley is not a toe loop and with the prevalence of video review in major competitions, maybe it's time to bring back the toe walley. Video review could allow technical panels to accurately determine the take-off edge and award the jump properly. This is really no different than the current issues with flip and lutz. If we're going to be consistent, one could argue it makes sense to either bring back the toe walley or combine the flip and lutz into a single jump as well.

CONCLUSION

Most skaters and coaches are surprised that single jumps only rotate between a quarter and a half turn in the air (except axel). But I've found that many skaters really benefit from knowing that double and triple jumps (except axel) don't really need to rotate 2 or 3 times in the air.

To get a summary of the jumps, see Appendix 1.

For more information on these concepts, please sign up at Skating Jump Secrets.

http://www.SkatingJumpSecrets.com

If you feel this information is useful, please pass a copy along to someone else in the skating world. Feel free to print out pages or make a complete hard copy and set it out at your rink.

Let's get a discussion going on these concepts so all skaters and coaches can benefit from this information.

Appendix 1

JUMP TABLE SUMMARY

Please feel free to print out this page and take it to the rink for discussion. It's a very interesting conversation starter for coaches and skaters!

The "take off direction" represents the most efficient take-off position based on rotational considerations and takes into account what is currently getting credit in competition. The "total minimum rotation in the air" is just the minimum requirement assuming an efficient take-off and minimum legal landing at 90 degrees short of the flight path.

Important Note: All jumps lift off the toe pick.

Jump Name	Take off direction	Minimum rotation in the air
Waltz Jump	Forward/Sideways	About ¼
Salchow	Forward	¼
Toe Loop	Forward	¼
Loop	Forward	¼
Flip	Forward	¼
Lutz	Forward	¼
Axel	Sideways	About 1
Double Salchow	Forward	1 ¼
Double Toe Loop	Forward	1 ¼
Double Loop	Forward	1 ¼
Double Flip	Forward	1 ¼
Double Lutz	Forward	1 ¼
Double Axel	Sideways	About 2
Triple Salchow	Forward	2 ¼
Triple Toe Loop	Forward	2 ¼
Triple Loop	Forward	2 ¼
Triple Flip	Forward	2 ¼
Triple Lutz	Forward	2 ¼
Triple Axel	Sideways	About 3
Quad Salchow	Forward	3 ¼
Quad Toe Loop	Forward	3 ¼

Appendix 2

ABOUT THE AUTHOR

Trevor Laak is a figure skating coach and coaching consultant in Madison, Wisconsin in the United States. Trevor is a member of the Professional Skaters Association but holds no special ratings or rankings. Trevor maintains that nearly anyone with an interest in figure skating can verify the claims made in this report. No special knowledge or coaching expertise was required to analyze the video and write the report. Only an ability to properly identify the jumps was required.

Nevertheless, Trevor has a highly technical engineering background, including a Masters degree in Electrical Engineering and 6 US Patents. Trevor began coaching in 1999 and has been analyzing skating jumps on the computer since 1995. Trevor is a staff member of Audrey Weisiger's Grassroots to Champions seminar series. He is passionately committed to helping skaters and other coaches and has created a number of skating websites listed in Appendix 3.

Appendix 3

OTHER SKATING RESOURCES

In addition to Skating Jump Secrets, Trevor Laak has recently created iCoachSkating.com, a paid membership website exclusively for figure skating coaches. The website focuses on coaching education and provides an online location for like-minded coaches to share ideas and information.

iCoachSkating.com has replaced Skating Coach Quiz, another website created by Trevor Laak to help educate coaches. All content at Skating Coach Quiz was free, and iCoachSkating.com will continue the tradition by providing some free content to visitors and non-paying subscribers.

Trevor has also shared many insights and technical discussions at his blog, the SkateCoach Blog.