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## I WASN'T THAT GOOD AT BASEBALL. AND, IN ALL LIKELIHOOD, NEITHER WERE YOU.

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**N**ow, it's entirely possible that you and I had moments of success in our baseball lives that fuel our passion for the sport to this day. As parents and coaches, we're continually inspired by the impact of those moments—and the personal development that came with them. We're also inspired to pass on our love of the game to our children, the next generation of players, because of the positive impact those moments have had on our sense of self, even many years later.

My most significant moments in the game took place before and during high school. Yours could have taken place in or after high school, in college baseball, or even in affiliated or non-affiliated professional baseball. Regardless of how significant these mo-

ments are, they probably didn't lead to a playing career in the MLB, **because almost no one makes it to that level.** Compared to those athletes who are fortunate and skilled enough to make it into MLB, the overwhelming majority of the rest of us simply aren't that good.

Between when I was born in 1977 and 2004 (the birth year of an 18-year-old player taken in the 2022 MLB Draft), approximately 8,000 players have made it to the big leagues and played at least one game. In the same period of time, 98.4 million children were born in the United States,<sup>1</sup> and 3.7 billion in the entire world.<sup>2</sup> **So, those drafted players represent 0.0002162% of all children born in the world in the same time period.**

Athletes who make it to this ultimate level of competition are absolute outliers in the strictest sense of the word. The point of emphasizing the stark reality—and near impossibility—of any kid making it to the MLB level in a book on youth baseball development is to define our objective very clearly. It certainly can't be getting every player to the big leagues. Reading and executing the training covered in this book **will not guarantee your player a spot on a big-league roster, or future-proof your child's college scholarship.** That is not—and cannot—be anyone's rational objective for youth training. Committing to that outcome is tantamount to committing to being struck by lightning, and the lightning strike is about as likely.

<sup>1</sup>National Center for Health Statistics, part of the Centers for Disease Control and Prevention

<sup>2</sup>United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition

Instead of a commitment to the impossible, in this book **our sole focus is player development**—specifically maximizing developmental opportunities for players between the ages of 9 and 14. Doing this well means addressing both the athletic development and the sport-specific skill development of our players, because of the definitive link between the two that informs current and long-term performance. Beyond that, we need to pursue this developmental pathway in a way that doesn't compromise the player's health, as our primary means of development—sustained application of stimulus over time—requires participation. You can't participate if you aren't healthy.

We also need to acknowledge and address the relationships between instructor and athlete. In youth baseball this is often a relationship between a parent and their child, or a parent and someone else's child. The power and tone of this relationship can bring both positive or negative leverage to development depending on how it is used. We will clearly define how we can help players and coaches move away from some of the negative traps in youth baseball, toward a more positive and rewarding experience.

Last but certainly not least, we need to approach this developmental objective with an eye for keeping baseball fun and engaging for players at these ages. If we know that most kids' experience in baseball is defined by significant highs and even more significant lows, and that they have a mountain of video games and apps at their fingertips they could choose to play instead, we should intentionally construct an environment that keeps them on the field because of how engaging it is. **Ideally this is an environment that, more often than not, makes players feel good.** This doesn't mean we need to artificially prop up a kid's experience or

avoid telling them the raw truth—that winning feels better than losing. Instead, we will demonstrate that on either side of the game outcome we will be there to love, support, challenge, and encourage them.

Fortunately, this system for developing youth players is not predicated on my meager high-level baseball experience. Instead, it's based on the fundamental principles, training, tools, and systems that Driveline Baseball has used since 2009 to successfully train thousands of professional baseball players, tens of thousands of college baseball players, and hundreds of collegiate and professional teams. Whether it's the equipment we use, the training modalities we employ, or the way that we use data to understand and develop players, all of these once highly unusual coaching products and methods are quickly becoming ubiquitous at the higher levels of the game. We will take the fundamental principles of these best-in-the-world developmental systems, then modify and optimize them as necessary to suit the unique needs of younger players, in order to maximize their development.

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*Knowing how to set a goal, work hard toward it, and construct a system to quantify improvement over time is an incredibly valuable skill.*”

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This approach to youth player development is also informed by the time that I've spent—more than a decade—coaching youth baseball, both at a recreational and a “select” level. Whether you're running individual training sessions for your own child, or running a full team practice, we'll equip you with the understanding of how to create fun practices for your players, so that they stay engaged—which actually makes skill training more effective, too. **The more they love playing baseball, the more they'll want to play baseball**—and the more they'll learn about themselves along the way. We'll also talk about how to apply these ideas in a team setting, relative to your schedule.

We'll spend a decent amount of time explaining the why behind these concepts and their application to youth players, because when you really understand how training and skill development works, you can structure and execute it more effectively. The better you understand the principles behind why we train the way we do, the more likely you'll be able to successfully implement this approach with your player or team.

Ultimately, the objective of this book is to help you build better baseball players at the youth level—players who are set up for as much success as possible as they grow. If we acknowledge the ultimate difficulty of achieving every kid's dream of making it to The Show, rather than trying to tell them they can't, we can instead identify and seek out another reason to play: love of the game and appreciation for their developmental progress. If we can't guarantee them a spot in the big leagues, the best alternative we can aim for is teaching players to understand **the value of their personal development**—both within and outside of sports. Knowing how to set a goal, work hard toward it, and construct a system to quantify improvement over time is an incredibly valuable skill. It plays just as well in life as it does on the baseball diamond.

Ultimately, this approach to youth skill development revolves around what I believe to be the most important function we have as coaches and parents of youth baseball players: **keeping their dreams alive**. Despite the statistical impossibility, it's often the case that this dream of playing high level baseball as an adult is what motivates their participation as a child. As a coach you are in effect a steward of these dreams—which are altogether undefined. Kids understand what it truly means to be a professional

baseball player in the same way that they understand what it means to be an astronaut (which is to say not much, other than the rocket part). But even with that lack of definition, the dream remains just as compelling.

So, how do we keep that dream alive? By keeping the pursuit of the dream as fun as possible. I'm confident that executing the structure of this program will help improve your player's skills, but **executing the program with joy is just as important as executing the program at all**. No matter how advanced their skills may or may not be, most children are motivated by the activities they enjoy. This can sometimes be at odds with the core of what baseball is: a game that, at its pinnacle, is both incredibly hard and incredibly technical. In consideration of this, we want to inspire as much joy and love and fun as possible in the way that we teach it.

One of the things we value most about our game is how it teaches us perseverance, but youth players will only develop the perseverance to stay in this game if they love it, and they're a heck of a lot more likely to love it if they're having fun playing it.

*Fun is good—and, in fact, necessary—in teaching the game of baseball.*

The more you can be mindful of this as a coach or a parent, the better your experience coaching, and your kids' experience playing, will be.

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*You're afraid to go down to where the stones stand, but not because you're afraid of what may come once you enter the circle. You're afraid of what may not come. You're not afraid of the great world, Eddie, but of the small one inside yourself.*



**Stephen King**  
The Waste Lands

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# FEAR, FAILURE AND FULFILLMENT

Whether you purchased this book to work with your own child or you're using it to train a whole team of youth players, we need to reinforce the ultimate intent of our approach to skill development very clearly. **We want to create more competitive 90' baseball players**, and we want them to have both a love of the game and a skill set that inspires them to play for as long as they want and as long as they can. What you will get from this book are structured plans to develop skill, along with an understanding of why we take the specific approaches that we take. Our approach is based on either our

experience working with the best baseball players in the world, research-proven principles regarding skill acquisition, experience coaching youth players, or some combination of all three. What you're responsible for bringing to the table—either as a parent or a coach—is a positive attitude that conveys love for the game of baseball to your players.

That said, we need to be honest about the current state of our game at the youth level, and why we see a need to explicitly bundle skill development **with positivity and engagement**—because of their capacity to bring much needed change to youth baseball as a whole.

One of the most disturbing trends that's taken place in the last decade or so is a dramatic increase in poor behavior by adults—parents and coaches—involved in youth sports. While it's hard to quantify this change specifically as it relates to the amount of poor adult behavior, we can quantify one of its outcomes: **decreased numbers of umpires who are interested and available to officiate our games.**

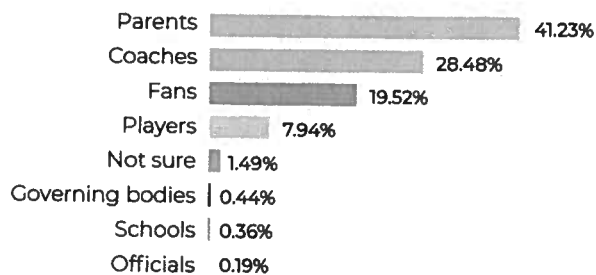
A recent study by the National Association of Sports Officials (NASO)<sup>3</sup> revealed that poor adult behavior is the given reason that over 75 percent of high school officials resign. Furthermore, 80 percent of new officials quit within just two years of starting. This issue has worsened since March 2020,

as **30 percent of officials have not returned**, leading to a drop in membership from 29,000 to 23,000.

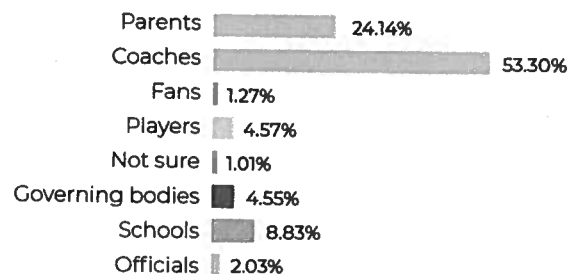
This data maps to what I've seen anecdotally. In 2022 I sat in the ABCA (American Baseball Coaches Association) Youth Committee meeting and listened as one of the heads of a national baseball umpire association explained that the current generation of umpires was largely made up of people between the ages of 50 to 70, and that there simply was not another generation of 30- to 50-year-old umpires coming up behind them. **Without umpires we quite literally cannot play games, so we need to treat this issue—and the reasons for it—with appropriate seriousness.**

## Who contributes to sportsmanship and how?

Who causes the most problems with sportsmanship?



Who is most responsible for improving sportsmanship?



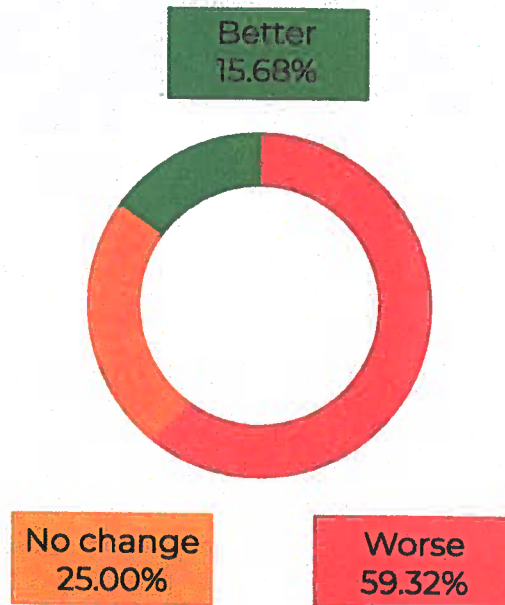
Although about 40% of officials believe that **parents cause the most problems with sportsmanship**, over half of respondents believe that **coaches are responsible for improving sportsmanship.**

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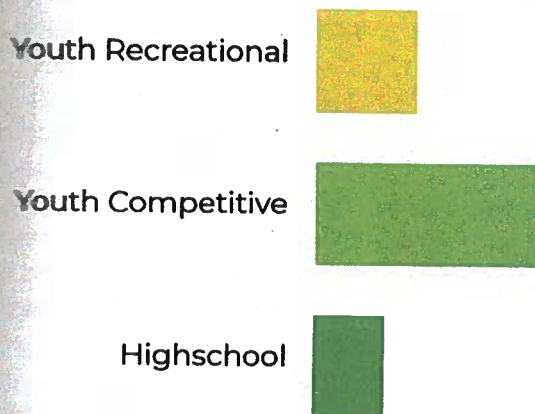
All of the data points to what has made umpires' jobs less enjoyable and led to diminished umpire participation: **poor sportsmanship on behalf of parents and coaches.** And at what level is this poor sportsmanship the most prevalent? Youth sports—specifically what they identify as “youth competitive,” meaning travel or select teams.

# What about sportsmanship?

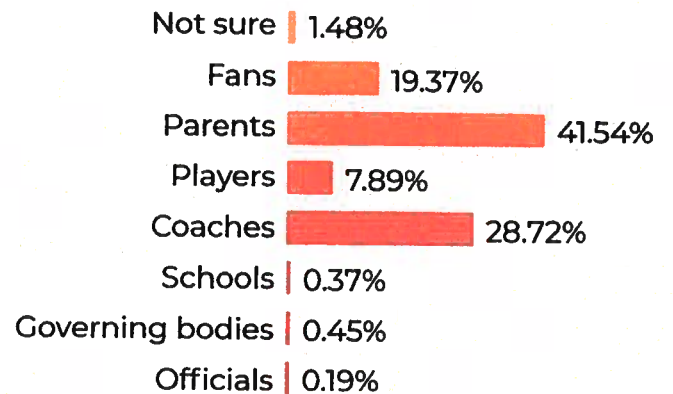
Is sportsmanship getting better or worse?

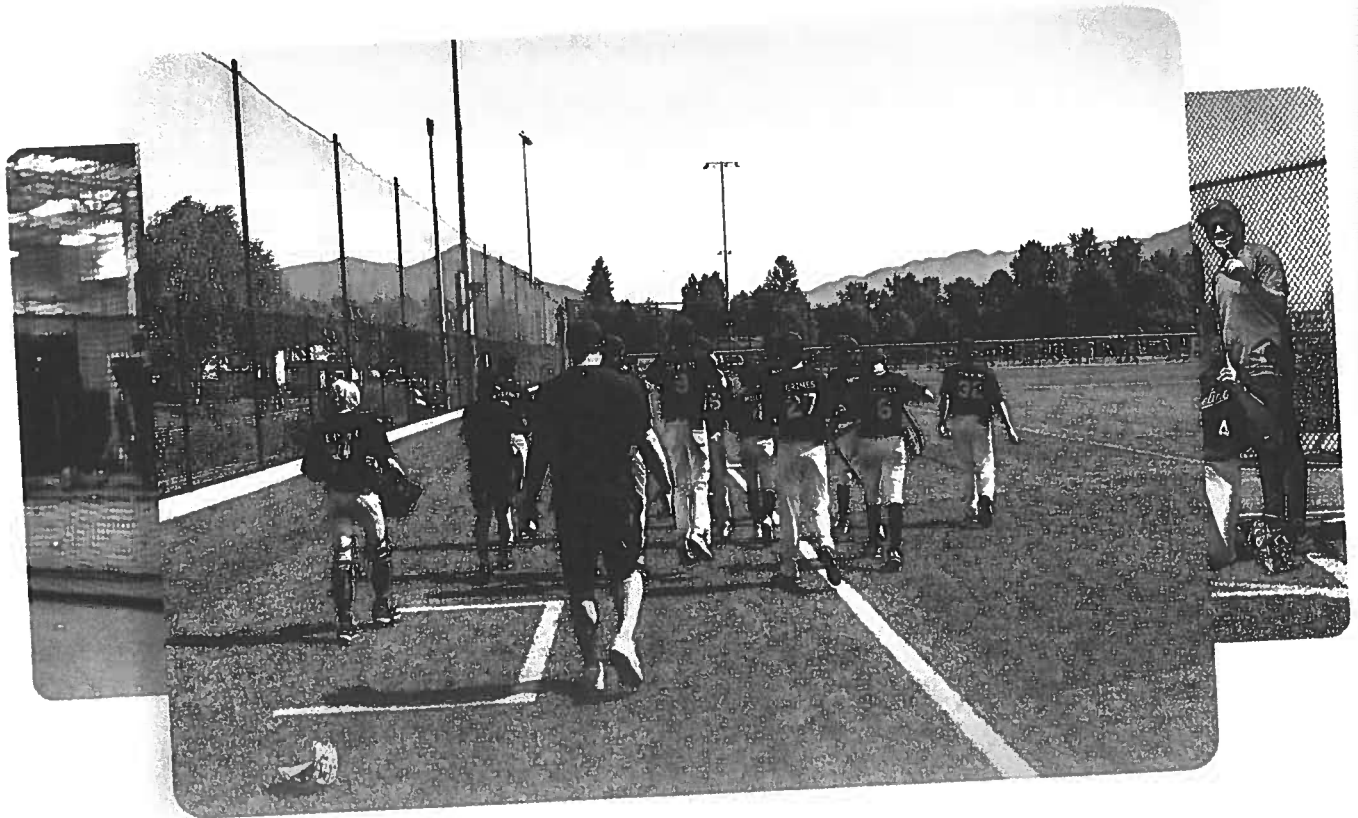


At what level is sportsmanship worst?



Who causes the most problems with sportsmanship?





Most attempted solutions to this problem have started with trying to increase the penalties for targeting and harassing umpires, and —, given that in a NASO survey almost half of the respondents said they have feared for their safety because of administrative, coach, spectator, or player behavior — those initiatives should continue. But it's also worth thinking about what I believe to be at the root of this poor parental and coach behavior **parents' fear of what their children's failures mean for their future.**

I had the opportunity to coach my two children in Little League baseball for over 11 years. It was always an absolute privilege to be on the field with them, but the raw truth is that I didn't always treat it that way. Now that my kids have transitioned out of youth baseball, when I look back **I have just as many moments of regret for my embarrassing behavior as a coach as I do moments of profound joy watching my kids play the**

**game.** That is the truth, as uncomfortable as it may be to admit. I believe that it's important to speak plainly about this, only so you, the reader of this book, might avoid some of the mistakes that I made.

I certainly never intended to be a bad youth baseball coach in terms of the inappropriate emotions that I displayed on the field, but the reality is that I had many moments where that would be an accurate assessment. If I had to distill down the reasons for my poor behavior at that time, it likely comes down to two very simple things:

- Defining my coaching performance by my teams' wins and losses, which led to...
- Fear of what those losses meant about both my players and me as a coach

At the high school level and beyond, this cer-

tainly makes more sense, given the age of the players and the competitive landscape at that stage of the game. At the 9- through 12-year-old level, though, it absolutely did not make sense. Again, kids aren't small adults, so if you're judging your instructional and leadership abilities as a youth coach based on how your players perform in games, **you're highly unlikely to get a valid signal**, mostly because kids are always going to be kids.

Here's a story to underline this point about the inherent and uncontrollable variance in youth sport, and how it can affect team competitiveness. At the end of one recreational baseball season, we were playing a round robin "league championship" tournament with the other teams in our division. I had arguably my best pitcher set to start our first game. He starts warming up—and clearly doesn't look right on the mound. He's not only throwing slowly but is also incredibly inconsistent with his accuracy. I go out to ask if he's feeling ok and he tells me that he's a little tired. I ask why, and he tells me that he had a "test" that day in PE that included **60+ timed sprints, going from one end of the gym and back as fast as he could**. As he was a competitive kid, he wanted to do as many of those sprints as possible—more than anyone else in his class. Unfortunately, the aftereffects of that competitive spirit were now having a direct effect on our team's chances of winning, so instead of following the plan, which was to have him throw as many pitches as the MLB Pitch Smart guidelines allowed, I allowed him to throw the first two innings and that was it. This had a downstream effect on the team's pitching depth, both in that game and over the course of the entire tournament, but I felt as if I had made the right choice in order to increase the likelihood of keeping that player healthy.

I use this example to paint a real picture of the lives of these 9- to 13-year-old athletes we're dealing with in youth baseball. **Their**

**lives are beautifully chaotic**, and fighting back against that chaos is a losing battle. We aren't talking about advanced high school, college, or professional athletes who are able to more directly manage their activities leading up to practice or competition. We're talking about kids—and whether it comes to attentiveness, focus, nutrition, sleep, or preparation, they're just going to present much more variance than any other class of athlete.

Beyond this, if you're attempting to execute an approach to youth baseball that emphasizes skill development, it's entirely possible that you give up wins to teams that execute the exact opposite—a **game theory optimal approach to winning youth baseball games**. My mistake was erring on the side of skill development without re-evaluating my approach to wins and losses—I continued to put emotional value on winning while running my teams in a developmental fashion, **but was still fearful of what those nearly inevitable losses and failures might mean** about myself as a coach, the team as a whole, and my own two children on the team.

To be clear, the emotions that make parents fear what they perceive to be their children's failures are completely understandable. At the most basic level, my job as a parent is to keep my kids safe—it's effectively my biological imperative. This imperative for safety can be problematic in coaching—especially in baseball—when it causes parents to create a fear-driven environment for their player or their team, **when that fear is fueled by the results of competition**. This is especially unfortunate at the youth level, because there is truly nothing to fear other than your player(s) no longer enjoying the game and not wanting to continue to play.

Most kids learning to play baseball, and in turn learning to love baseball, have the dream of playing at a high level, but that ultimate "destination" is at best vaguely understood, as they have a child's understanding



of the activity. **It's defined by the spectacle;** kids have no idea how much tedious work it takes to get there. The trick is that—nebulous or not—their dream is still a dream, and kids' attachment to the dream is what motivates them to put in the effort to make it come true.

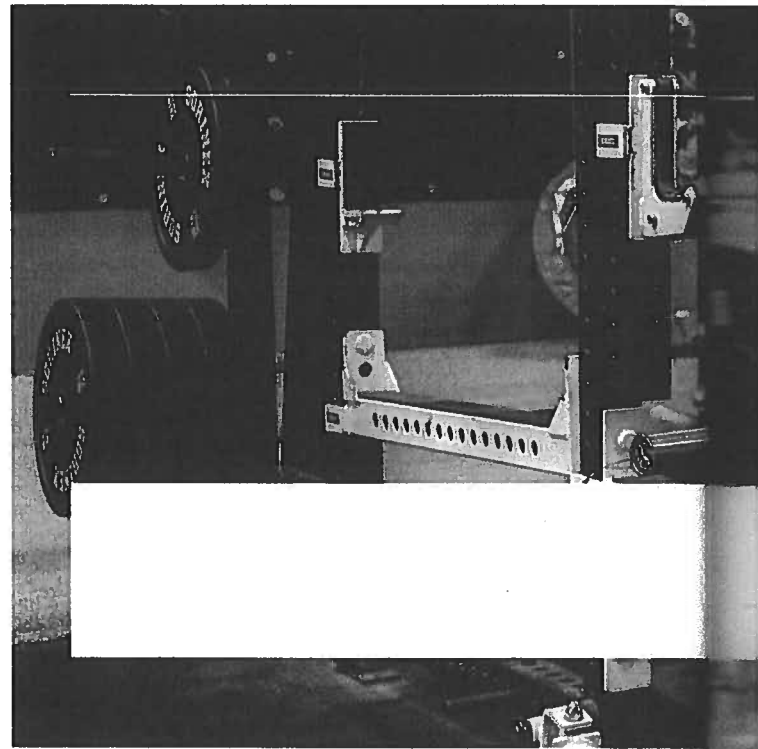
Over time, it becomes clearer what it actually takes to even have a shot at a career in the major leagues. And along the way, it's entirely reasonable—and likely—for a child to find other dreams. That's entirely OK—and, furthermore, is out of our hands as parents and coaches.

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*If players are going to stay in this game and come to accept the tremendous struggles, failures, and perseverance it requires, then it should be their choice to continue, not something dictated by a parent.*

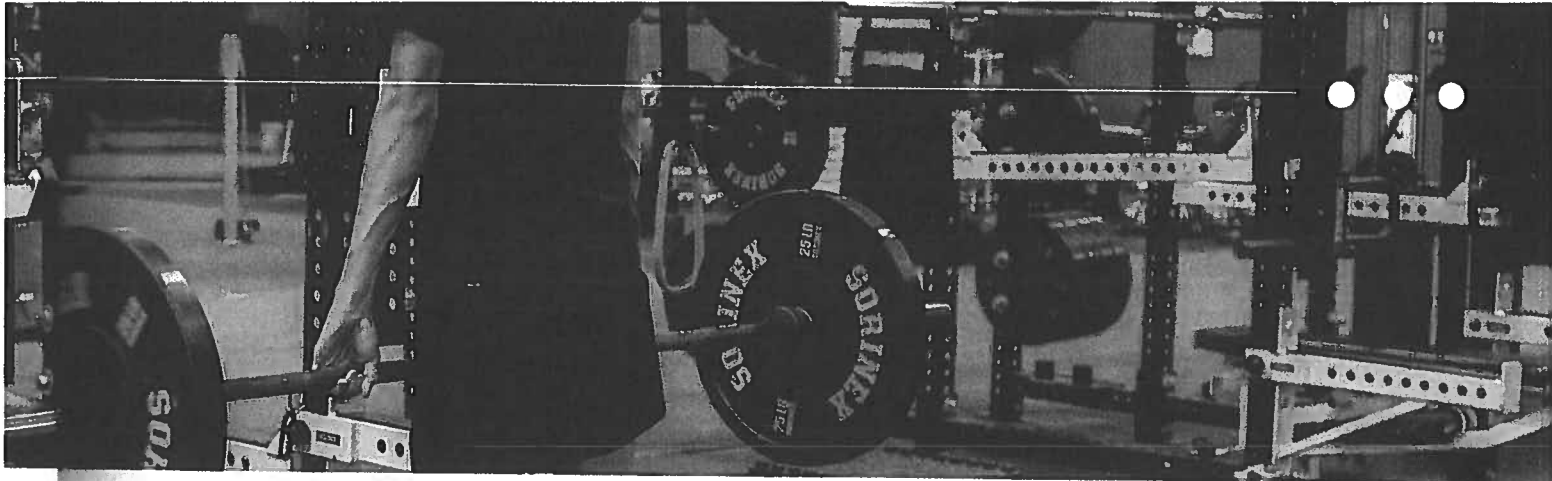
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And if you behave like a jerk on a baseball field, whether motivated by your own fears and failures or those of your team, it's likely that you're doing real damage to these kids' dreams—either your own kid, who has no desire to introduce this kind of toxicity into their relationship with their parent, or the other kids on the field. Frankly, neither is acceptable.



The alternative to this perspective—the one in which we as coaches and parents are terrified of our children losing because of how it reflects on us—is very simple: be a conductor of their joy. Be a steward of their dreams. **Help the game be a source of fulfillment in their lives, and let the rest of it go.** If we do our jobs then these same kids will keep playing the game, and eventually will get to a place where winning and losing will matter. We gain nothing if we inappropriately accelerate players to that destination at the expense of their enjoyment.

The concepts we advocate for are designed to inform the entirety of your approach to coaching youth athletes through a specific lens and with a particular intention. We want our players' experience in youth baseball to be as fulfilling as possible. Our data-driven, goal-setting approach to skill development **aims to inform not only their approach to sport but also their approach to life.** And our focus on skill development is intended to maximize our chances of creating a player who is competitive and competent on the eventual 90' baseball field.



## HOW TO GET THE MOST OUT OF THIS BOOK



One simple concept will help you and your players get the most out of this book:

# Consistency.

For coaches, depending on their experience and history, some aspects of our approach to youth development may seem challenging, initially. This challenge may result in coaches going back and forth between this "new" approach and their old habits, cues, and approaches. Instead of being halfway committed to two different worlds, our suggestion is for coaches to analyze their historical cues and coaching habits **and think deeply about how to apply them through this new lens.** Doing so will give coaches a toolbox of cues, concepts, and ideas that consistently interact with each other in pursuit of our larger objective. This approach will also make athletes' lives easier because all aspects of how they are being coached and taught are in agreement.

For players, the inherent nature of our approach is longitudinal. The second day of training is informed by what was programmed and accomplished on the first day, the third day is informed by what was programmed and accomplished on the second day, and so on. **Our training is designed to have maximum effect when applied consistently over time,** which is very different from the standard "triage" style approach to youth training. In the latter approach, a flaw is identified and then a "fix" is applied, with negligible analysis of whether the fix has any significant and quantifiable impact on player performance—or whether that fix is sticky enough to have a lasting impact beyond one lesson.

Coaches being consistent in this approach and players being consistent in their training will help both parties get maximum value and results over time.



# REASONABLE EXPECTATIONS FOR COORDINATION WITH YOUTH ATHLETES

Every athletic movement a child makes, including on a baseball field, requires, some degree of coordination and proprioception.

In coordination tasks, different body segments need to work in concert. Think about how a child learns to sign their name. This movement task is vastly less complex than either throwing a ball or swinging the bat. It is a fine motor task that does not require a full body sequence to execute, but it does require the coordination of multiple body parts. **If you ask most children in youth baseball to sign their name 10 times, you'll get 10 different signatures.** The reason for this variance in task output is not the child lacking an intention of consistency. The issue is that the systems of coordination the child brings to the task itself are still developing.

Proprioception, then, is the athlete's awareness of the position and movement of their body—in other words, the ability to know where their body is in space. When we think about the game of baseball, **almost everything we do on the field involves proprioception.** For example, even hitting a stationary ball on a tee leans heavily on the athlete's proprioceptive ability, because their ability to put the bat in the right place relative to where the ball is on the tee will determine whether or not they make contact. The athlete will be coordinating the movement of their body, and those movements will be more effective when the athlete is more aware of where their body is in space.

Understanding what's happening in the bodies and minds of our players helps us be better and more effective coaches. Their bodies are changing, sometimes dramatically, and their internal sense of where things are

is always trying to catch up. Consider that each player is going through this process at a different rate, and you get a sense for how challenging it is for them to carry out our instructions. **Keeping this in mind helps us be kinder, more patient, and ultimately more effective.**

An example from outside of baseball can help clarify the principle. Consider an event that takes place right around the same time players transition from the small field to the big field: learning how to drive. Most of the time when kids are learning how to drive, we put them in vehicles that are easy for them to operate, relative to their comparative inexperience, or smaller cars with easy to use controls.

As parents we feel relatively confident that these types of vehicles are going to be a good fit for our young drivers because their meager dimensions, limited power, and simple controls **are a good match for the driver's developing abilities and experience.** Would we feel this type of relative confidence if we put that same young driver behind the controls of a monster truck? No. Between the huge physical dimensions, complex controls, and abundant power output, that vehicle is not set up for our young driver to manage.

We want to work with *and* in consideration of all this biological variance, instead of constantly trying to fight it. Asking or expecting youth athletes to move with a degree of accuracy to which they are not biologically inclined sets them up for failure and is incredibly problematic for long-term development. **Because when athletes are asked or expected to prioritize movement accuracy above all else, they typically reduce movement speed and, in turn, motor output.**<sup>7</sup>

Assessment of Skeletal Maturity and Prediction of Adult Height (TW1 Method) - Tanner, Whitehouse and Healy, 1962 and Assessment of Skeletal Maturity and Prediction of Adult Height (TW2 Method) - Andrew k. Poznanski, 1977

<sup>7</sup> Internal versus external focus of attention and motor learning: Challenging a widely accepted dichotomy by Wulf and Lewthwaite (2016)

# THE PROBLEM WITH PUTTING MECHANICS BEFORE OUTPUT WITH YOUTH ATHLETES

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For as long as baseball has been taught to youth players, coaches and parents have focused and fixated on mechanics. This is not always an ill-intentioned endeavor. We presume that by focusing on mechanics we are helping our athletes, **as if the installation of "correct" mechanics now will help their performance and safety in the long term.** While this intention comes from a good place, it flies in the face of what we have already established in terms of the typical biological capacity of our youth athletes, and carries other concerns as well.

Typically, our best and most understood models for ideal mechanics all come from the most elite baseball players in the world: adult professionals. No matter how detailed, comprehensive, or accurate our understanding of the mechanics expressed by these adult competitors, they are simply a bad fit for a youth player, **who shares next to no similarities with adult professionals** when it comes to their respective biological systems.

Additionally, there is a large difference between pattern matching, where we see someone performing a movement and use it to inspire our own movements, and trying to perfectly mimic the movements of another person without possessing that person's identical biology to make it actually possible. Of course, the throwing and hitting mechanics expressed by professionals can be used for reference and inspiration, but **we can't reasonably expect youth athletes to immediately—and perfectly—match their movements.**

This method of coaching mechanics is often tightly linked to coaching drills, where

the athlete is tasked to perform a variety of drills in a specific manner intended to drive the acquisition of ideal mechanics. The mechanics are chosen first, and then drills based around those mechanics are created and implemented. This is very different from a training environment where players are asked to solve a task and given the freedom to find a mechanical solution that accomplishes the goal.

Certainly, when coaching older athletes, some form of both methods of instruction, mechanical and goal-based, can be successful. And even with youth athletes, some players who received strict mechanical instruction have maintained long and successful careers. But regardless of anyone's anecdotal success, a mechanics-based approach can come with some limitations and concerns specific to long-term development.

**The mechanics-based approach is in direct conflict with the base biological state of most youth athletes.** They are not proficient enough in body awareness and movement to consistently execute these types of mechanical approaches and "correctly" configure their bodies without a reduction in motor output. They can have one repetition that looks perfect, then another that is drastically different. Intention did not change, yet their mechanics and resulting movement did. So motor output is taken away to improve movement accuracy.<sup>9</sup>

This is the perfect example of a short-term solution—accurate drill/task execution—that creates a long-term problem, which is simply that **a player is de-incentivized**

<sup>9</sup>Baseball batting and fly ball hitting are sensitive to perceptual illusions induced by misleading contextual information - Rob Gray (2009).

<sup>10</sup>Movement accuracy and variability in the evolution of motor learning by Sainburg, Poizner, and Ghez (1993)

from learning how to accurately move as fast as possible. In essence, in order to obtain an 'ideal' set of mechanics, kids may move slower, making it hard to train the engine and, to a degree, move faster as they age.

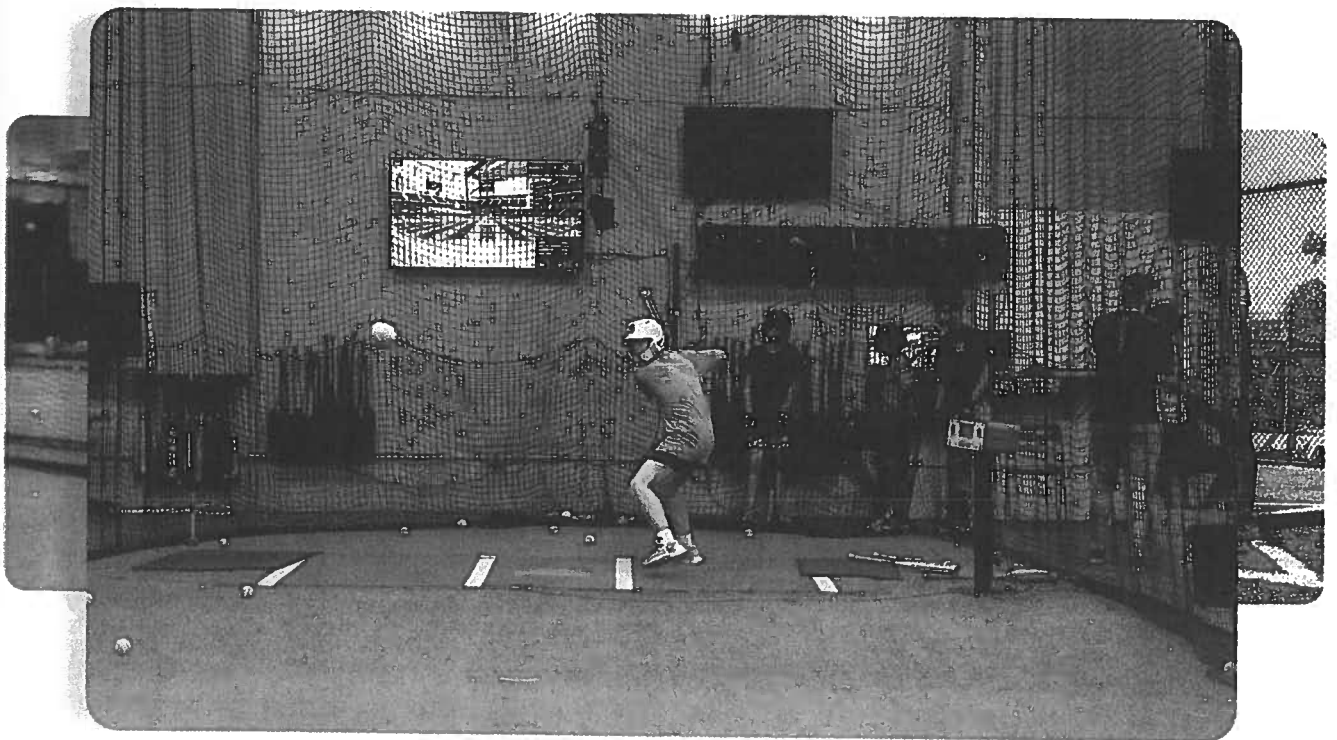
A drill-based approach can also be difficult for youth athletes developmentally, if our drills either come with too much mechanical instruction, or if there is no specific emphasis on the output of the drill. For example, if we ask an athlete to make contact at a specific depth of the plate in order to hit the ball "backside" toward the second baseman, often times the athlete is given praise, or the drill is considered a success, when the drill task is achieved—deep contact in the zone and hitting the ball to the opposite side of the field—even if they didn't make quality contact. A player may be told it was a good swing in the drill, even though they hit a weak line drive that is easily turned into an out in competition.

In this example, there is no link between correct drill execution and the actual output of the drill, which robs the athlete of in-

credibly valuable feedback. It also makes it so they never receive any output feedback—positive or negative—to internalize. If one specific swing movement created a more ideal result than others, we want to incentivize, hone, and develop that movement. Output feedback is what makes those movements stand out.

Mechanics and drill-based approaches often assume output, meaning if you perfect the mechanical movements in the drills, the positive outputs will follow, but how would you actually know whether outputs are improving if you aren't measuring them?

This is something that we need to continually be aware of, and a reason not to simply replicate specific movements while ignoring the result of those movements. **This doesn't mean mechanics aren't important; we just need to put them into context.** As coaches, we need to take a breath and understand that creating high-performing baseball skills is a process that takes time and that, in the current term, whatever mechanics our youth players express will be informed by both their strengths and deficiencies.



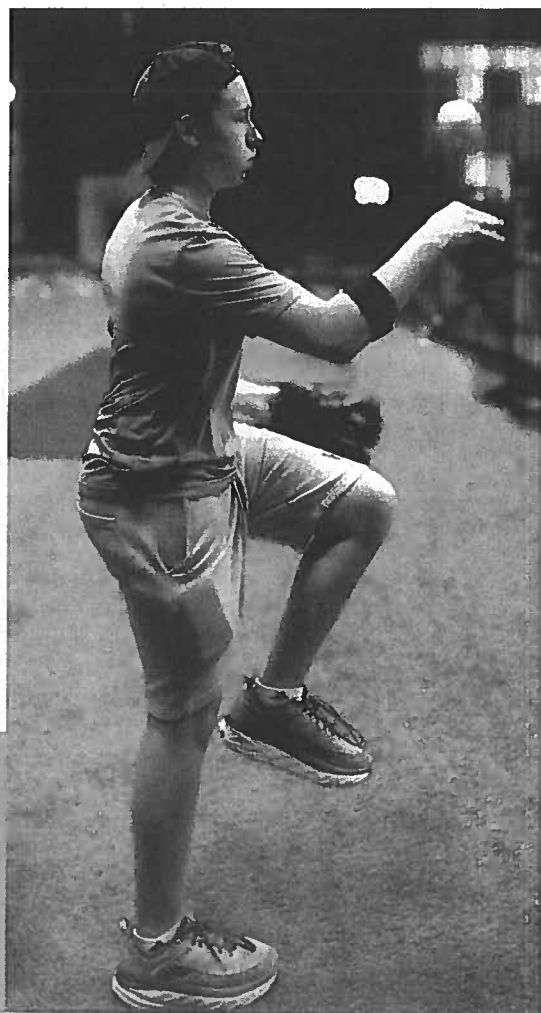
# THE SMALL FIELD NOW

AND THE

# BIG FIELD

# THAT COMES NEXT

Beyond these biological issues, we also need to address the highly specific environment of youth baseball—the physical configuration of the fields, as well as the athletes that fill those fields—and how those two factors combine to create a truly unique environment—one that changes drastically once our players' time in youth baseball ends.



Most youth players start on fields where the pitching mound is 46' away from home plate and the base paths are 60' long, with fences around the 200' mark. These fields are typically around 46,000-52,000 square feet in total. When players graduate from youth baseball, they move to the conventional 60' 6" pitching mound and 90' base paths, on fields that are generally around 105,000-110,000 square feet—**which amounts to an approximate 285% to 335% increase in play space.** In comparison, adult soccer fields are approximately 233.3% larger than youth soccer fields, adult football fields are 138.5% larger than youth football fields and adult basketball courts are around 35% to 51% larger than youth basketball courts.

Not only is this change in play space extremely significant in terms of scale, it is just as significant in terms of speed. Players are on these smaller 46'/60' fields until around the age of 12, and the switch to full size 60'/90' fields takes place around age 14, which amounts to a 10.92% increase for ev-

ery one of the 24 months between the two ages. Once you get behind this curve it can be a challenge to catch up.

In addition to these physical changes, we should address the competitive environment of youth baseball based on who's playing, and how that affects what strategies tend to work most effectively to win games. **Spoiler: these strategies don't work forever.**

On fields filled with young players whose skills and tactical understanding are still developing, the competitive environment is as different from conventional baseball as the fields are. This unique competitive environment gives rise to some strategies that are highly unlike anything that we expect from players at later levels.

One of the biggest limitations in the youth game is the competitive abilities of youth pitchers and catchers—and how this affects the running game. With weak catch-

ing, which is understandable given player age and inexperience, we end up with more passed balls than at any other level of the game. Even when youth catchers do receive or block balls, their arm strength is often inadequate to prevent runners from advancing at will. The end result is a competitive environment **where a walk is often as good as a triple** in terms of how likely it is that the player will score.

Another limitation in the youth game is general defensive competence. At higher levels of the game, between the increase in physical play space and increasing player skill, softly hit ground balls are commonly turned into outs. This is not often the case with youth players on youth fields, where simply making contact of any kind will often result in a base hit because of defense incompetence. **Bad contact isn't seen as bad in youth baseball**, because any contact is likely to be successful.

This same general effect can be seen in the pitcher-batter matchup and how youth players are commonly trained. On the pitching side, for a very long time parents have asked and coaches have (often) demanded that players "just throw strikes." Suffice it to say, those three words drastically misrepresent how hard it is for a prepubescent child to throw a baseball over an 18" wide plate from 46 or more feet away.

Throwing strikes is hard, for children and everyone else. There is often the impression that adult players at the MLB level are able to deploy pin-point accuracy. While these professional athletes certainly have their moments, the data tells a different story: **their average miss distance is more than 12."**<sup>11</sup> When it comes to the average child, we should give them at least as much latitude,

if not much more, than we give adult professionals.

An additional problem for our youth pitchers is that a lot of youth hitters will either get themselves out due to their low bat-to-ball skills, or are generally incapable of adequately punishing pitches that are not thrown fast enough, don't move/spin enough, or some combination of both. This is absolutely not the case in any level of baseball that comes next. So the approach incentivized by the youth environment—throwing strikes at the expense of output—**isn't revealed to be unsuccessful until the landscape changes.**

We can see a similar environmental effect on our youth hitters. Coaches and players seem to infer the optimal nature of a contact-first hitting strategy, where generally inadequate defensive performance compels everyone to often emphasize contact at the expense of output. These contact-oriented, output-lacking swings **do not resemble anything competitive at the levels that follow.** And even with these types of contact-oriented swings, the perceptual task of deciding when and where to swing is still going to tax a youth hitter's limited mental model, making even bad contact unlikely at times.

All of these strategies work toward the same thing: a "game theory" optimal approach to winning youth baseball games that only works in youth baseball. To be clear, it's not that it's bad to throw the ball accurately or to make contact, or that those aren't necessary attributes of competitive players on a 90' field. To the contrary, they are some of the critical skills that we intend to develop; the difference is that we intend to develop these skills **paired with output, instead of divorced from it.**

# COMMON ISSUES

## OF PARENTS COACHING THEIR CHILDREN

Another tricky aspect of youth baseball, and perhaps the most significant difference between youth baseball and any other level of the game, is that a significant number of youth coaches are also the parents of the athletes they are coaching. To say that this configuration of coaches having a biological relationship to their athlete is unique is an understatement, which can bring significant challenges.

As a best-case scenario, we want involved parents in youth baseball. The issue is the way that this involvement is expressed and to what degree it affects coaching. When it comes to parents and their children, often times a parent's most basic biological imperative is simply to protect their children and keep them safe. "Safe" can mean a variety of things in different settings, but in a youth sport context it often simply means winning. **Winning is a safe competition outcome for both parents and children to conceptualize** because it doesn't require explanation; we know what it means to win.





On the other hand, losing opens the door to a number of questions that the parent or player may not be prepared to answer (or may be afraid to):

For The Player

- **Was I not prepared enough?**
- **Am I not good enough?**

For The Parent

- **Did I not do an adequate job of training my player or my team?**
- **Is my team or my player not good enough?**

Remember when we said we wanted involved parents? Well, to whatever degree a parent takes ownership of their team's game performance, **that ownership may pull the parent in a negative direction.** This is especially true if the only way they evaluate their performance in the head coaching role is by whether or not their team won a game.

Players at this age are generally compelled by what could be called a first principle conception of competition outcomes, with first principles meaning the fundamental concepts or assumptions on which a theory, system, or method is based. For most youth players, their first principle approach to competition is winning is good because

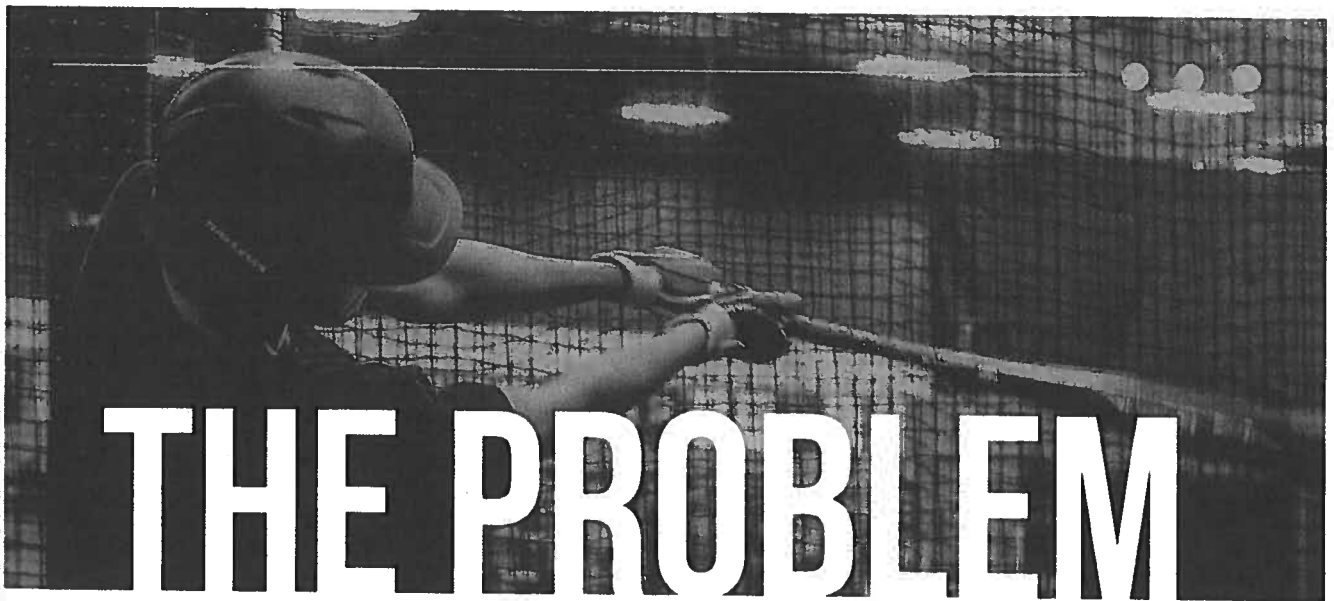
winning makes them feel good, and losing is bad because losing makes them feel bad. Again, these players are already likely to struggle at a cognitive level with their inability to differentiate the competition outcome from the way they define their participation experience. Lacking this ability, players tend to see the game outcome in incredibly binary terms:

- **We won and I'm a winner**
- **We lost and I'm a loser**

Being aware that their child will be emotionally affected by the competition outcome in this way, it's understandable that a highly involved, well-intentioned parent who coaches would take responsibility for cultivating the player's or team's approach to competition and aim it solely towards maximizing the likelihood of finding the "safe" outcome and avoiding the "unsafe" one.

While it's understandable to be sensitive to our athlete's desire to win and avoid a negative emotional response, **we don't have to let them be defined by it.** The best way we can start to solve that problem is to help our players find something valuable about the context of their baseball experience that doesn't depend on winning any particular game.





# THE PROBLEM

## WITH CHASING ONE CARROT

When our environment is comprised of youth athletes who struggle to put context to competition outcomes and parent-coaches with a strong desire to see their children and players be “safe” (with everything that implies), **it’s no great surprise that children are commonly coached in a way that prioritizes the immediate outcome above all else.** This is especially true when winning is the sole outcome that we track and use to evaluate our players/teams’ development.

Once coaches or parents fixate on wins as the sole resource to acquire, there is only one way to collect more of that resource: **you have to play more games.** Additionally, in order to maximize the possibility of winning these games, you’ll want to run a game theory optimal approach which is highly specific and highly effective in the current environment. Unfortunately for players’ long-term potential for success in the game, this isn’t winning with an approach that resembles what it takes to win on a 90’ field. It’s typically the exact opposite of that.

The widespread negative effect of this game theory optimal approach is that instead of

maximizing the development opportunity we should have in youth baseball, **we minimize it for the sake of winning games whose value rapidly diminishes.** And what do we gain with all this winning? High school coaches do not ask players at tryouts about their youth baseball statistics or win/loss record. College coaches are not offering roster spots or scholarships to players based on this criteria. What are they actually looking for? Athletes who will be competitive in a 90’ environment.

The problems with this approach of playing an excessive number of games, and playing them with a game theory optimal approach, are numerous. **We are simply missing a window of time to balance skill development and gameplay,** and the fidelity of the signal we get from winning games in this highly specific environment is of questionable quality at best.

The opposite of this approach is skill building for all players and training toward goals that are ubiquitous, not specific to one environment.

We call this approach Skills That Scale.



# DATA USED FOR ENGAGEMENT & GAMIFICATION

Another beneficial aspect of training with data is how it can be used to drive engagement. In an academic sense, by engagement we mean: “The degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education.”<sup>12</sup> Another benefit of engagement is that it **makes players more resilient to challenge and difficulty**. Given that baseball is one of the most difficult games that children will play—and that it only gets more difficult over time—we should specifically try to cultivate this type of engaged resiliency in our youth players.

We also want to engage youth players with data using some simple concepts of gamification—the application of typical elements of game-playing (point scoring, competition with others, rules of play) to other areas of activity, in our case training and competition. Most youth practices are devoid of this kind of “game scoring,” which has several consequences. When players are given a game-like structure to a drill in practice, **they’re able to participate in that drill with a clear objective**. And when they accomplish that goal in the drill—scoring points in the games we construct—they are rewarded.

These very simple concepts are highly impactful for bringing intention and engagement to our practices. **Our players already participate in similar gamification loops** (getting incremental rewards for achieving set goals), both in school and recreationally. In school, students frequently take some sort of “assessment” of their proficiency in various subjects at the beginning of the school year, then they re-test those skills toward the end of the year and receive a clear percentile or rating progress attached to their development.

This same system happens in things players do for fun; video games very commonly give them “XP,” or experience, whenever they play the game, regardless of whether they actually win. This experience accumulates over time, so that the player’s “level” increases the more they play. Because of this, players are incentivized to play the game more and more often.

Contrast this with the information players get about the value of their participation through the box score of an average youth game. **A player can do everything right and get no “reward”**. As a hitter, being on time and on plane for the incoming pitch, hitting the ball hard—none of that has any value in the box score if the ball is caught for an out. But by taking a gamification approach we can reward points—parallel and in addition to what you would find in a box score—to the positive actions we want to incentivize:

- **Aggressive swing on a hittable pitch**
- **Hitting the ball hard**
- **Hitting the ball in the air**
- **Advancing the runner**

Attributing data—or points, in this type of gamification—to any of the positive actions above **trains players to find value outside of the outcome** and specifically rewards them for what they are able to control on a baseball field.

<sup>12</sup> Larry Bernstein. What is Student Engagement and Why Does it Matter? Xello Blog. April 8, 2022. <https://xello.world/en/blog/student-engagement/what-is-student-engagement/>

# SKILLS THAT SCALE

## EXPLANATION OF THE CONCEPT

The concept of Skills That Scale and its application in youth baseball is pretty simple, as it relies on two fundamental and related ideas:

1. The skills you use more frequently are more important than the skills you use less frequently
2. Putting a majority of our focus into the development of these skills will compound their value over time

We call them "Skills That Scale" because they are fundamental abilities that aid a player's transition from the small 60' baseball field to the big 90' field, helping meet the increased demand for skill paired with output in this larger play space.

Baseball is a challenging game as it is. When the dimensions of the field suddenly get much bigger—before many players' bodies are ready—the challenge goes up even more.

Our response to this evaluation of the youth baseball landscape is to prioritize the development of the primary tools for success in the game—hitting and throwing—based on their importance. Certainly it is true that there are other pathways to develop young players for future success. But through a first principle evaluation of what matters most for young players, **we choose to focus primarily on the development of hitting and throwing**, as these are simply the things that players do the most on a baseball field.

Having this focus doesn't mean that we ignore other aspects of developing young players, or that we otherwise neglect to teach the game of baseball. A best-case scenario implementation of the Skills That Scale **doesn't turn baseball into a carnival game**, where the only thing that matters is the equivalent of ringing the bell on a strongman station. Instead, it simply means you spend most of your practice time on the skills that will have the most impact on a player's ability to compete in the game today, tomorrow, and every day that follows.

# SKILLS THAT SCALE

## DEFINITION

At Driveline we orient our collegiate and pro training around what we call The Big 3 of both hitting and pitching.

### The Big 3 of Hitting

Bat speed—how fast you can swing the bat

Contact quality—how good you are at making hard contact

Swing decisions—how good you are at swinging at hitters' pitches

### The Big 3 of Pitching

Throwing velocity—how hard you can throw

Command—your ability to throw the ball where you want  
"Stuff" or pitch movement—how well your pitches move

To keep things even simpler, we distill these down to what we call the Skills That Scale for youth players:

### Hitting Skills That Scale

Bat Speed—how fast you can swing the bat

Exit Velocity—how hard you can hit the ball

### Throwing Skills That Scale

Throwing Velocity—how fast you can throw

Hitting a Target (Command)—throwing the ball accurately toward the target, from the mound or in the field.

# SKILLS THAT SCALE OF YOUTH HITTING EXPLAINED

Most of our training is oriented around bat speed and exit velocity for simple to understand reasons: most youth pitchers aren't very good at throwing strikes. By focusing on 'building the engine' of bat speed and exit velocity, our youth players will start to figure out what pitches they hit the hardest and which they don't, indirectly working on swing decisions.

## **Bat Speed**

**Bat speed is the foundation of every player's hitting skill pyramid.** When you look at the best players in the game at every level, the most productive hitters are generally the ones that produce the most bat speed.

We'll detail the focus on exit velocity within its specific section, but it's worth touching on in relation to bat speed due to the physics involved with the bat to ball collision. Despite what has been regurgitated by coaches for decades, **the pitcher does not supply the power.** As demonstrated by the research of Dr. Alan Nathan at the University of Illinois, for every 1 MPH of bat speed, you can generate 1.2 MPH of exit velocity, assuming a perfect bat-to-ball collision. The same cannot be true for the velocity of the incoming pitch, where each 1 MPH of pitch speed contributes 0.2 MPH of exit velocity—again, assuming the same collision efficiency between bat and ball.<sup>13</sup> Put simply, **bat speed is the most important ingredient in hitting the ball hard.** Anyone trying to tell you differently is arguing with what's been proven in physics. You can argue with physics as long as you want, but you'll run out of breath before you're right.

An underrated benefit of bat speed is how it maximizes the value of non-ideal contact, which all players commonly make. When players make non-ideal contact, you can sort those outcomes into two basic buckets:

- **Balls hit hard enough that they are not easily turned into outs**
- **Softly hit balls that are more easily turned into outs**

Generally speaking, if you don't hit the ball very hard, you're making the defense's job easier, as defenders have more time to get to softly hit balls. The opposite is also true. **Hitting the ball hard is good,** and while it would be great if we could predicate our youth hitting strategy around old school concepts like "hit it where they ain't," the cold reality is that for the average youth player **making good contact is challenging enough.** Simply hitting the ball hard—which takes bat speed—is the purest and most effective directive we can give our players.

## **Exit Velocity**

We focus on exit velocity because if bat speed tells us a lot about what went into the bat-to-ball collision, exit velocity tells us a lot about what came out—the outcome. Exit velocity tells us not only about bat speed but also about how efficiently the player **translated that bat speed into exit velocity by generating flush contact.** When it comes to youth players, focusing on exit velocity gets us close enough to how we evaluate contact quality for older athletes, while keeping things appropriately simple.

Again, hitting the ball hard is good for a number of reasons, but a key benefit is how hard-hit balls translate to the larger field. On a 46'/60' youth field, the distance from home plate to second base is 84' 10"; so, let's just say that you generally need to hit the ball 80' or further to get through the heart of a youth-sized field. On a 60'/90' field, the

distance to 2nd base is now 127' feet. Those 43' of extra distance are significant; players need to hit the ball a lot further to make it through the infield. Given how quickly players transition to this larger field, **we need to focus the intention of our training accordingly**, so they're more prepared.

### Distance a Baseball Travels (in feet) per Angle & Initial Speed of Batted ball

Batted Ball Speed (MPH)	Trajectory Angle		
	0°	30°	45°
25	19	43	45
30	23	59	62
35	27	77	81
40	31	98	102
45	36	121	124
50	40	146	147
55	45	172	171
60	50	199	195
65	56	226	219
70	62	255	242
75	68	283	266
80	75	311	288
85	83	338	310
90	93	365	331
95	102	391	351
100	114	417	370
125	203	540	453

# SKILLS THAT SCALE OF YOUTH THROWING EXPLAINED

We believe that most youth pitchers need to work on throwing faster while consistently hitting a target, without worrying about offspeed pitches. Time spent trying to throw hard to multiple locations greatly outperforms the time spent learning other pitches, because, again, **throwing the ball hard and doing so accurately has more positive leverage over a longer period of time.** The same is true for all youth players, pitching aside; throwing hard is good in the current term and the long-term, whatever position you play.

## **Throwing Velocity**

Throwing velocity should be one of the most common-sense priorities in youth training because of its universal benefit for both position players and pitchers. No matter where a player is on the field, **increased throwing velocity correlates to increased performance.** Pitchers take away decision-making time from hitters, and fielders give themselves more time to field the ball because they need less time to get it to the destination.

Monitoring throwing velocity also allows us to monitor fatigue. We'll talk specifically about pitching workload and pitch counts later in the book. For now, the important thing to understand is that if we're able to quantify a player's base level of throwing velocity, **we can measure against that number to check for fatigue,** which is useful in both training and competition. Given that a number of research studies correlate fatigue with injury risk,<sup>14,15</sup> being alert to changes in velocity helps us protect players' health as we develop their skills.

## **Hitting a Target**

While throwing velocity is the foundation of our throwing skill pyramid (like bat speed is for hitting), we want to pair that output-based metric with an appropriate focus on accuracy so that we can track and evaluate the effectiveness of that output.

It's often presumed that prioritizing velocity means we ignore the need to throw the ball accurately in the game, but that's not the case. We don't want to sacrifice one of these core performance attributes for the other—we intend to develop both. Specific to the skill of hitting a target, developing this ability without harvesting velocity means structuring training so that players are constantly intentional with their attempt to command.

Later in the book we'll discuss strategies for scaling the challenges of developing command to match a given player's ability. We'll also cover some of the research-proven principles behind variable implement training, and how throwing objects of different weights and sizes—with a consistent and constant intention of hitting a target—can actually help players improve throwing command. And while sometimes we actively encourage players not to worry about hitting a target, for instance during a strictly high intent throwing phase, at every other phase of training our focus on pairing velocity with accuracy remains constant.

For the maximum training effect, we want to develop throwing velocity and throwing accuracy in both isolation and conjunction.

<sup>14</sup> Factors for Injury. MLB.com. <https://www.mlb.com/pitch-smart/risk-factors>

<sup>15</sup> Prone Pitching Activities and Injuries in Youth Baseball: Findings From a

National Sample - Yang (2014)

<sup>16</sup> Prone Pitching Activities and Injuries in Youth Baseball: Findings From a National Sample - Yang

# SKILLS THAT SCALE

## SUMMARY

The best youth players will generally excel in all four of these abilities. Hitters that swing fast and hit the ball square, resulting in a high exit velocity, will perform the best. Pitchers and fielders who can throw hard at a target will pitch the most and be put in defensive positions where they are more likely to make plays.

By being aware of the biological complexities at play, and by understanding how the skills we've identified need both isolated and combined attention during training, we have an opportunity to maximize the benefit we can offer to our players while we have them, setting them up to be as competitive as possible when the game changes.

Taking advantage of the opportunity we have in the low-consequence environment of youth baseball, **we can develop "good problems" for high school baseball coaches.** To best understand and unpack that idea, think about two different players at their high school tryout, using a 1-5 scale (1 being lowest, 5 being the highest):

Player A represents the arc of development that results from a more common focus—optimizing for winning games on a youth field. They're significantly behind the curve when it comes to skill output—understood in our Skills That Scale framework as lacking throwing velocity or bat speed—but are advanced when it comes to the refinement of the output skill they do have. Players that present this way are consistent or better strike throwers but lack competitive velocity, or are players with exceptional bat to ball skills, **but commonly lack the output that would make those bat to ball skills more productive**—in other words, they can hit the ball, but not hard. We're also giving this player another half point leverage on baseball IQ, just to represent a player who has spent a little more time on this aspect of their game (likely by playing more games instead of taking time to balance training and game play) at the expense of developing output.

Player B, on the other hand, is advanced for their age when it comes to skill output, **but**

<i>Composition</i>	<i>Player A</i>	<i>Player B</i>
Skill Output	2	5
Skill Application	5	3
Baseball IQ	4	3.5



**can't yet apply that output as skillfully.**

To picture a player that presents this way, think about a kid who throws the ball faster but has a difficult time being a competitive pitcher at 12 through 14 because they throw more balls than someone like Player A. Or one who has good bat speed but may swing and miss more than you'd like. We're also making this player slightly less refined in terms of their overall baseball IQ, assuming that their balance of training and competitive play has led to slightly less on-field learning. While this player may not have been dominant in competition at the youth level due to the reduced ability to deploy their output skills, **they're better set up to have a chance to be a competitive player at the 90'** because of what type of problem they represent.

We can say that Player B presents a "good" problem for a good high school baseball coach, because this player **already has the underlying skills to compete**—they just need to be refined. And it's good timing, because during this stage of biological development we can expect a player's coordination and proprioception to continue to improve.<sup>16</sup> As covered previously, while kids aren't small adults, as they get older their ability to regulate and control their bodies will naturally improve. Beyond that, we would hope that a good high school baseball coach will see

this opportunity for what it is—the **possibility of a sophomore starter on the Varsity team**, because the player wasn't fundamentally behind the competitive curve.

Player A presents a much tougher problem to solve. This player was built to be competitive in a completely different game, and so is fundamentally behind the curve in terms of skill output. While it is true that both Player A and Player B will experience some gains on the strength side with age, which will correlate to increased skill output, every other player on the field will accrue similar benefits, so the limitations in output Player A brings to the field will be a challenge to overcome. Player A will have to work harder to resolve these deficiencies **just to be on the ragged edge of viability** on a 90' baseball field.

The point of this approach is to set our players up to be competitive until they're responsible for remaining that way, likely after they enter high school. They can and should be responsible for all of the decisions that follow. **We just don't want our former players to get cut on the first day of tryouts—or get turned into an equipment manager**—because we missed a crucial window of opportunity to develop what's needed on a big field.

