Baseball Pitchers Pre-Performance

Justin Otto, Dr. Noah Gentner, Dr. Dan Czech, Dr. Trey Burdette, David Biber

Justin **Otto** is currently a counselor education Ed.S. student at Georgia Southern University. He obtained his bachelor's degree in psychology from Oklahoma State University in 2009 and his master's degree in kinesiology from Georgia Southern University in 2011. His current research focuses on mindfulness, as well as self-perception concerning personality and social facets.
jo00693@georgiasouthern.edu

Dr. Noah **Gentner** is a former assistant professor of Sport Psychology/Coaching Education at Georgia Southern University. Education includes an M.S. and Ph.D from the University of Tennessee.
 noah.gentner@humber.ca

Dr. Dan **Czech** is a former Collegiate and Professional Baseball Player and Major League Baseball International Envoy to over 54 different countries around the world. Dr. Czech is currently a Professor and Director of the Sport Psychology Graduate Program at Georgia Southern University.
drczech@georgiasouthern.edu

Dr. Trey **Burdette** is an Assistant Professor of Coaching Education in the Department of Health and Kinesiology at Georgia Southern University. He earned his Ed.D. in Educational Leadership from Georgia Southern University, studying coaching behavior and leadership. He also received his M.S. in Health and Kinesiology from GSU in 2003. He earned his B.A. from Maryville College in Maryville, TN in 2001. His primary teaching responsibilities are in Coaching Education, undergraduate and graduate, and his research interests are in sport performance and sport leadership. He has instructed at both national and international coaching clinics. In his leisure time, he enjoys participating in athletics, reading, and traveling.
gburdette@georgiasouthern.edu

David **Biber** is receiving an M.S. in Sport and Exercise Psychology from Georgia Southern University. He is a graduate assistant in the Physical Activity and Healthful Living Program and instructs physical activity classes. Research interests include exercise adherence, motivation, positive psychology, and the relationship between sport and prayer.

Abstract

Previous research suggest that a pre-performance routine can improve athletic performance by helping athletes focus their attention, eliminate distractions, reduce anxiety, and enhance confidence (Lidor and Singer, 2000; Weinberg and Gould, 2003). Little has been studied qualitatively concerning pre-performance routines; thus, the purpose of this study was to examine professional, minor league Baseball Pitchers' pre-pitch routines including their thoughts on the routines and their reasoning behind them. This study used a semi-structured, exploratory interview design. Subthemes emerged from the data collected: 1) observation, 2) letting go of the past, 3) breathing, 4) readjustment, 5) cognitive automaticity, 6) dictated by previous pitch, 7) external focus/cues, 8) routine sequence, 9) routine importance, 10) physiological regulation, 11) routine development, and 12) routine variance. These results can be used to endorse several strategies in skilled baseball pitchers in order to optimize their pre-pitch routine in an attempt to reach peak performance.

Introduction

A pre-performance routine can be defined as a systematic sequence of motor, emotional, and cognitive behaviors that are performed immediately before the execution of self-paced tasks (Cohn, 1990; Lidor & Mayan, 2005; Tenenbaum & Eklund, 2007). A self-paced task is performed in a relatively structured and predictable environment, where the participant can control the timing in which they perform the task (Tenenbaum & Eklund, 2007). It has been found that nearly all skilled athletes that play a sport containing a self-paced task have a pre-performance routine (Jackson, 2001; Lidor & Singer, 2003; Tenenbaum & Eklund, 2007), which helps them reach a preparatory state before performing a task (Kingston & Hardy, 2001; Lidor & Singer, 2003).

Past research suggests that a pre-performance routine can improve performance by helping athletes focus their attention, eliminate distractions, reduce anxiety, and enhance confidence (Gentner, Gonzalez, & Czech, 2008; Lidor & Mayan, 2005; Czech & Burke, 2003).

Past research has examined the temporal and behavioral consistency of pre performance routines (Czech & Burke, 2003; Jackson, 2001; Jackson, 2003). Research regarding the psychological aspects of pre-performance routines has been scarcely investigated (Yancey, Czech, Joyner, & Zwald, 2007; Ploszay, Gentner, Skinner, & Wrisberg, 2006). While most studies have looked simply at the outcome of a performance after using a routine, Cotterill, Sanders and Collins (2010) qualitatively investigated the athlete's perceptions of their routine and performance. Nine super-ordinate themes emerged: allocation of attention, psychological skills, shot selection, routine mindset, routine composition, compulsive behaviors, routine evaluation & application, top players, and moderating factors.

Allocation of attention centered refers to the ability to switch focus on and off, as well as helping the athletes stay in the present. Athletes noted that their pre-performance routine prevented distraction. The other psychological skills athletes mentioned were preventing distraction, enhancing confidence, as well as using self-talk, relaxation, and imagery. Along with all of these mental factors, the athletes' routines were also impacted by other moderating factors that could potentially "influence the successful execution of the routine." (Cotterill, Sanders, & Collins, 2010, p. 60) These factors included stress, tension, pressure, playing in big events, internal and external expectations, and fatigue. Being able to cope with these factors could benefit the athletes greatly and aid in success and optimal performance.

Many quantitative studies have investigated pre-performance routines, but very few have used qualitative interviewing to assess the athlete's perceptions concerning their routine. The purpose of this study is to fully examine professional, minor league baseball pitchers' pre-pitch routines including their thoughts on the routines and their reasoning behind them. Interviews will be conducted to understand the pitchers' perceptions of their pre-performance routines. The structure of the study is a semi-structured, exploratory design. The semi-structured interview will allow the questions to be flexible in order to understand the participants further and explore any new data comprehensively.

Method

Participants

The participants used for the study were seven (N = 7) professional, minor league baseball pitchers. All of the pitchers were considered active for the 2010-2011 minor league baseball season and had been pitching for a minimum of five years prior to the study. They were all over 18 years of age (See table 1). The participants were sought out for the study via phone, text, or email.

Procedure

After IRB approval, participants were recruited via purposeful sampling. Informed consent was read via telephone and verbal consent was requested and recorded. Semi-structured interviews were conducted and recorded over the phone. Participants were notified that the interviews were being recorded with a tape recorder. Personal information including their name, address, their birth-date, what professional baseball team they played for, and whether they were a left-handed or right-handed pitcher was requested. Since the interviews were done over the phone, after thoroughly reading the consent form, each participant was asked if they would accede to the terms by committing to a verbal signature. Upon giving verbal consent, the interview began. Once the participant's interview was tape-recorded, it was assigned a number and transcribed using the assigned number in order to assure confidentiality. Any contact information concerning the participants were printed off and placed in a locked drawer for safe keeping.

Interview Protocol

The interviews consisted of five open-ended questions. Probing questions were asked using the participant's wordage to gain a deeper understanding of their experiences. Probing allows for further explanation or clarification of the responses (Patton, 2002).

Data Analysis

The structure for the qualitative analysis used in this study was adopted from a methodological approach developed by Czech et al. (2001) and Patton (2002). This procedure contains the following four steps: 1) Approaching the interview, 2) Focusing the data, 3) Reduction, and 4) Releasing the meanings. Once the themes were formed, the data was then presented in a clear, descriptive manner. This was done in order to gain an in depth, rich description of the participants' experiences and perceptions (Patton, 2002). Reliability within a qualitative study is determined by the ability of others to produce consistent results across time (Czech et al., 2001). To insure this step, the following questions were used throughout the data collection process (Goodrich, 1988): Do the descriptions capture the experience? Does the structure match the co-participant's experience? Does the structure emerge from the data? Do others see the description? (as cited in Czech, 2001). Validity can be increased within a study by using triangulation. Triangulation within this study included a bracketing interview, member checks, the primary researcher, a journal, an advisory committee, a pilot study, and the use of NVivo (Silver, 2009; Patton, 2002; Czech, 2001).

Results

Four themes emerged from the transcripts: I) Previous Pitch, II) Adjustment, III) Next Pitch, and IV) Routine Facets. Previous Pitch had two subthemes: 1) observation and 2) letting go of the past. Adjustment had three subthemes: 1) breathing, 2) readjustment, and 3) cognitive automaticity. Next Pitch had two subthemes: 1) dictated by previous pitch, and 2) external focus/cues. Routine Facets also contained four subthemes: 1) routine sequence, 2) routine importance, 3) physiological regulation, and 4) routine development.

Previous Pitch

After throwing a pitch, nearly all of the pitchers would analytically focus on every detail of their last pitch. This type of analysis lasted for a brief period before the athlete attempted to allow their minds to move on to the next pitch or pitching sequence.

Subtheme #1: Observation. Some of the observations include how the pitchers performed during the previous pitch, their pitch location, the successfulness of the pitch, and how the batter performed during the last pitch.

> *"... just think and look at the hitter and kind of pick out some of the things that he might have done on the previous pitch. Whether he was, you know, leaning out over the plate, or whether he was cheating in, or if he was out on his front foot; where his hands are to see if I can get any advantage right off the bat, in that sense. After that, I kind of think about the pitch that I just threw and then focus on the pitch that I feel would be a pitch in that situation that could get the guy out. Obviously, I'm looking to get contact. Clearly for me, it's about if I can kind of find something that with his swing, or with his mechanics that will*

help me make a better pitch. That's kind of the stuff that I was thinking during it, so... Get the ball back, think about that, what I just saw from him, and what pitch would be the best to attack his weakness and also keep my strengths where they should be." (Participant 4)

Subtheme #2: Letting Go of the Past. Participants attempted to shift their focus by attempting to concentrate on the next pitch (performance) rather than thinking about or living in the past.

> *"...rather than thinking about what has happened in the past, or what happened the pitch before, or what happened two pitches before. I try to forget all that and get rid of all my emotions and just stay on the next pitch, on the next whatever it's going to be." (Participant 7)*

Adjustment

The pitchers discussed adjusting their thought process toward themselves to analyze and make internal adjustments. Much of the adjustment process was breathing in order to regulate focus, staying with the present pitch, slowing the game down, regrouping, recovering after a bad pitch, and finally, allowing their mind to move on to the next pitch rather than think too much.

Subtheme #1: Breathing (Internal Focus and Slowing Down / Physiological Regulation). The participants revealed many reasons for using breathing within their pre-pitch routines including to slow things down, enhance or readjust focus, controlling physiological and psychological imbalances, preparation for the next pitch, letting go of the last pitch, confidence, and staying in the present.

> *"I walk back up the mound, and I usually take in a deep breath or trying to let my mind go from that last pitch. So as I'm walking up the mound, I take a deep*

breath. I sort of re-center myself, my focus and everything." (Participant 3)

Much of what breathing and slowing things down was doing for the pitchers was regulating physiological effects of the body. The participants attempted to enhance performance by keeping the physiological aspects of the body, such as heart rate, muscle tension, and respiratory functioning, under control.

Subtheme #2: Readjustment. This subtheme was enhanced by breathing and dealt with readjustment of focus. Participants readjusted in negative situations after bad pitches as well as when things simply did not feel right.

> *"If I don't throw a quality pitch, I am more along the lines of, "What did I do? What didn't feel right? What didn't feel smooth?" I try to keep the mechanics completely out of it, but sometimes there's a little tweak or something you need to fix before the next pitch." (Participant 2)*

Subtheme #3: Cognitive Automaticity. In many cases, the participants were quoted as saying that they felt it was better if they cleared their mind and stopped thinking before the next pitch. Some of the athletes also talked about simplifying things as a means to reduce their thinking.

> *"And games where things are going bad, [I] try to minimize thought process. For me, it's impossible for me not to think about everything that's going on, so I try as much as possible to eliminate the main things; try to keep it as simple as possible. Separate my hands and throw a strike." (Participant 2)*

Next Pitch
Getting mentally ready for the next pitch was something every participant in the study mentioned. The concept of being concerned with the next pitch or pitch sequence was also mixed in with other themes such as breathing, physiological aspects, focus, regrouping, and staying in the present. The participants also mentioned the next pitch being a direct result of the previous pitch, concerning themselves with external cues, and being very committed to the next pitch.

> *"In fact, just breathing, [and thinking,] 'what am I doing the next pitch? What is the purpose of this next pitch? Am I trying to- to punch the guy out? Am I trying to locate the fastball away?'" (Participant 2)*

Subtheme #1: Dictated by Last Pitch. There were many references made to the pre-pitch routine or the next pitch being dictated by the previous pitch, the previous pitch sequence, or how the batter reacted. The athletes referred to looking at their past pitch and how the batter reacted in order to assess the next pitch.

> *"... pick out some of the things that he might have done on the previous pitch. Whether he was, you know, leaning out over the plate, or whether he was cheating in, or if he was out on his front foot; where his hands are to see if I can get any advantage right off the bat, in that sense. After that, I kind of think about the pitch that I just threw and then focus on the pitch that I feel would be a pitch in that situation that could get the guy out." (Participant 4)*

Subtheme #2: External Focus/Cues. The pitchers discussed how the information obtained from observations would be used in order to assess the next pitch. In order to do this, the pitchers would

turn their focus outward and concentrate on cues externally. The cues could be the pitch, the batter, the catcher, or the catcher's glove.

> *"Get the ball back, think about that, what I just saw from him, and what pitch would be the best to attack his weakness and also keep my strengths where they should be. After that, toe the rubber, obviously look down at the catcher, start getting that sign, and decide if we are on the same page and that's what we want to do. Then give him a good shake, come set, and focus on the center of his glove. Not necessarily trying to aim, but just kind of pick out a spot in the center of his glove so that at least you have that target that you're throwing at." (Participant 4)*

Routine Facets
In addition to psychological factors, factors such as the order of events of the routine, the importance of the routine, how they developed their routine, and how much their routine varied during competitive play played into their pre pitch routine.

Subtheme #1: Routine Sequence. The cognitive sequence began with the participant focusing on the previous pitch and/or forgetting the last pitch. After that, there was some variance in the next step of the sequence. Some of the participants discussed going into self-analysis and adjustment, and continuing on to focusing on the next pitch.

> *"The biggest thing for me is forgetting the pitch. I'm done with that pitch. [The] ball comes back to me, [inaudible words] situation, what the hitter just did, and umm, [and] basically just go with my gut instinct. [I] toe the rubber and take a second; take a deep breath. [The] first pitch that comes to mind and I feel confident with it, I go with it. If the*

> *catcher's not on the same page, then I, shake [him] off until he gets to that point." (Participant 1)*

Other times, the participants discussed going into a combination of internal analysis and working toward the next pitch (in which the two themes, Adjustment and Next Pitch, would overlap); sometimes, this would vary depending on the situation (e.g. good performance vs. bad performance).

> *"I mean, if there's something that I know I did wrong in the pitch before, I'll think about it. I'll remind myself how to correct it. I'll think about it for maybe four or five seconds tops, and then I'll forget it and I'll focus on the next pitch. And in my mind, I already know what the next pitch is going to be for me, as far as what reaction I got out of my hitter, or what reaction I got out of my pitch. I think about the next pitch, and then I'm thinking about that until I throw it." (Participant 7)*

Subtheme #2: Routine Importance. All of the participants felt their pre performance routine was incredibly important. Most of the pitchers felt that they would have trouble being successful at the professional level without a pre-pitch routine.

> *"I feel like it keeps me consistent throughout the whole game, and that's really the key to having success. It's being able to repeat your delivery and repeat pitches, and throw strikes. And I feel like having a solid, good pitch routine really helps out with that." (Participant 5)*

Subtheme #3: Routine Development. Many of the athletes expressed various ways in which they developed their routine. Some found inspiration

in coaches, siblings, other athletes, etc. while others just let their routine develop naturally. Most of the athletes said their routine developed over time and changed throughout their career.

> *"It's something that - it took many years for me to develop this routine. It doesn't really happen overnight. You learn as you go. And so this year, I really, between last year and this year, I'm more of a complete pitcher because I take the game one pitch at a time." (Participant 3)*

Discussion
Throughout this study it seems that pre-pitch routines may have psychological and physiological influences that may help in reaching optimal performance levels. Every participant mentioned the previous pitch, adjustment, and then focusing on the next pitch. The entire pre-pitch routine is aimed at successfully completing the next pitch.

Previous Pitch
With regard to the previous pitch, both observation of the pitch and letting go of the previous pitch were of optimal importance to the pre-pitch routines of the participants. In observing their environment, the pitchers adopt a means of concentrating on what is important during the previous pitch. Concentration is a "person's ability to exert deliberate mental effort on what is most important in any given situation." (Moran, 2004, p. 103) Within this brief amount of time, from the time the pitcher releases the pitch until the play ends, the pitcher is using selective attention in order to concentrate on relevant sensory and mental events and withdraw from others things around them (James, 1890; Solso, 1995). In this study, the pitchers discussed observing the previous pitch to aid them in deciding what their next

pitch was going to be to make personal adjustments for future performances.

In negative situations, letting go of the past can be a coping strategy. In a study on coping, female volleyball players felt that not letting go of mistakes they made hindered focus (Holt, Berg, & Tamminem, 2007). In this study, the participants made it a point to let that pitch go so they could fully commit to the next pitch.

Adjustment
Focus. Focus can be referred to as a key psychological component to success or one of the most important aspects of athletic performance (Anshel, 2012; Dosil, 2006; Gill, 2000). Internal focus cues are directed inward toward strategies, problem solving, organizing information, mental rehearsal, thoughts and feelings (Nideffer, 1990; Weinberg & Gould, 1995). Participants focused via breathing, controlling physiological variables, planning next pitch, correcting mechanics, refocusing, actively adjusting their routine, commitment, etc.

Another term for monitoring bodily functions and feelings to enhance focus is associative attentional strategy. This attentional strategy has been studied with long distance runners (Morgan & Pollock, 1977; Smith, et al., 1995) and aerobic tasks (Gill & Strom, 1985; Weinberg, Smith, Jackson, & Gould, 1984). The research states that for aerobic exercises, associative attentional strategies are ineffective. This type of internal, narrow attentional focus is exactly what participants of this study noted doing between each pitch.

Almost all of the participants mention slowing things down; which could relate directly to breathing, arousal and adrenaline. Breathing can have multiple functions such as keeping focus in the present, checking-in with oneself to determine level of self-control, gaining emotional control, releasing negative thoughts,

energizing oneself, facilitating trust, helping establish rhythm (Dosil, 2006) and regulating arousal levels to enhance the likelihood of a peak performance (Bunker, Rotella, & Reilly, 1985). Slowing things down, leveling out, centering, or reaching an optimal level of arousal follows the inverted-U theory of arousal.

The inverted-U theory "assumes a curvilinear relationship between arousal and performance" (Anshel, 2012, p. 131). The arousal/performance relationship is an inverted-U shape because when arousal is too high athletic performance can decrease. While the associative attentional strategy may not have been effective for endurance athletes, which requires a higher level of arousal, it may be effective in assessing physiological states for tasks that require lower levels of arousal. In combination with another routine variable (e.g. breathing), associative attentional strategy may be more effective at adjusting physiological states in order to prepare an athlete psychologically and physically for their next performance.

Readjustment. The participants used words like "re-center" (Participant 3), "regrouping" (Participant 1), "gathering myself" (Participant 6), "tweak" (Participant 2), and "adjust" (Participant 3 & Participant 4). All of these involve using the routine to make necessary physical, emotional, physiological, and psychological adjustments.

Cox (1994) referred to these types of adjustments by using two terms: centering and refocusing. Centering involves directing thoughts inward in order to make conscious adjustments concerning arousal and attention. Negative thought and distraction has an opportunity to affect the athlete if there is any sort of delay between external focus and skill execution. "You center your attention internally as you make minor adjustments in your level of arousal. Many athletes accomplish this by taking

a deep breath and exhaling slowly" (Cox, p. 84). Many of the baseball pitchers interviewed noted that this breath helped them slow things down.

Cox (1994) described refocusing as being closely related to centering and focusing. He notes that refocusing should be concentrated on attention, appropriate cues, and the task. Where athletes falter is by refocusing on errors and distractions that hurt their performance.

Cognitive Automaticity. Automaticity refers to skill mastery in that the skill requires no conscious control or attention to be completed. The skill becomes 'automatic' to the athlete (Cahmore, 2004). Automaticity was brought about by the pitchers by them attempting not to think. Some of the athletes discuss reducing cognition, and even attempting to reach a point of thinking about absolutely nothing. In terms of simplification, Tenenbaum and Eklund (2007) looked into a study conducted by Hatfield et al. (1984) that examined cognitive processes during skilled visiomotor behavior. It was suggested that "a shift in temporal asymmetry… suggests that the expert marksmen explicitly controls attention during the early part of the aiming period that quickly drops out with increased reliance on visual-spatial processing. The finding further suggests a refinement of nonessential cortical processes or the simplification of the strategic approach to shot execution" (Tenenbaum & Eklund, 2007). This is exactly what the participants of this study were doing.

Next Pitch
The previous themes were in effort to reach the proper preparatory state for the next pitch. Throughout this study, there wasn't a single athlete who wasn't investing nearly every bit of the routine towards the next pitch.

Dictated by Last Pitch. Something that was brought up by the participants is pitch selection. One aspect discussed was taking an assessment

of the last pitch, both internal and external, and using that information to help dictate the next pitch. As stated earlier with adjustment, Cox (1994) talked about making internal adjustments during a routine through a process called centering. Cox discusses attentional and arousal adjustment then focuses on an external cue or target, like the catcher's glove. Cox never mentions thinking about the previous performance during this process. The participants in this study attempt to forget previous pitches, but first assess the previous pitch and use that information to dictate the next pitch. It seems as though the pitcher tries to make the batter more of a predictable variable through analysis and assessment of multiple aspects of the batter in order see tendencies or weaknesses within the batter's approach, stance, and performance.

External Focus/Cues. External focus is directed outwardly on objects (Weinberg & Gould, 1995). Many of the participants mentioned narrowly focusing on items like the previous pitch, the batter, the center of the glove (target), and the situation (out, runner, balls & strikes). By focusing on these external cues, the pitchers get external feedback that can be used to assess the next pitch.

One participant talked about focusing on what he could control rather than "what happens behind me" (Participant 7). Dosil (2006) promotes this type of thinking in saying that it wastes energy and bases an athlete's confidence on things going on around them that they cannot control, "…players should focus on their thinking, attitude, effort, practice quality and preparation" (p. 168). With pre-pitch routines, this type of thinking falls in line with concentrating more on pitch location, pitch selection, pitching tempo, breathing, correcting mechanics, etc. and focusing less on items like teammates' errors, umpires' calls, the game's outcome, etc.

The idea of eliminating distractions comes down to focusing on relevant cues rather than irrelevant cues. Relevant cues are ones that help in producing optimal performance. Task-irrelevant cues hinder performance by distracting the athlete from reaching their optimal level of focus (Taylor & Wilson, 2005).

Staying in the present allows the pitcher to focus on relevant cues and disregard distractions. Taylor and Wilson (2005) refer to this type of thinking as mindfulness, saying that, "mindfulness teaches athletes to focus on the present rather than dwelling on the past mistakes or future results" (p. 58). Mindfulness allows for a calm physiological state accompanied by relaxed muscles, slower breathing, and lower heart rate, enabling the athlete to be more confident.

Routine Facets
Routine Sequence. Although not identical, it became apparent that all of the pitchers' routines followed a sequential order. Previous research has focused on the effect of routine consistency on performance outcomes within each participant, not consistency of routine between participants. For example, Lonsdale and Tam (2008) quantitatively examined temporal and behavioral consistency among NBA players. While temporal routine variance did not make a difference, sequential behavioral variation led to worse performance. Although important, the results did not address or analyze the sequential order of the routines.

Routine Importance. Pre-performance routines are considered very beneficial in sport psychology, especially in enhancing performance of self-paced tasks Tenenbaum & Eklund, 2007; Lidor & Mayan, 2005; Amberry, 1996; Jordan, 1994). Something that has yet to be researched is the importance a routine is to the athletes. Participants felt that a pre-pitch routine was very important to their performance. Every participant

claimed their routine to be very important to their success; it seems apparent the participants believe part of their success at the professional level is in relation to the pre-pitch routine they've developed.

Routine Development. The participants of this study cited several influences when it came to pre-pitch routine development. These influences include coaches, siblings, and other athletes. Consistent with previous research, most of the athletes noted that their current routine developed over time (Cotterill, Sanders, & Collins, 2008). The participants incorporated information provided by influences and, depending on positive and negative perceptions and/or performances, adjusted their routine throughout their pitching career.

Conclusion

It seems that pre-pitch routines may have psychological and physiological influences that may help in reaching optimal performance levels. The pre-pitch routine is a sequential process aimed at successfully completing the next pitch. The current study provides initial qualitative support for the effectiveness and importance of pre-pitch routines in performance.

As one of the first studies to qualitatively examine pre-pitch routines, future research could examine the effectiveness of Associative Attentional Strategy when applied to anaerobic activities. In depth, quantitative analysis could examine the frequency that pitchers across a variety of competition levels use the current themes and in what situations. It could also be beneficial to study how pre-pitch routines vary after both good and bad pitching. The effect of the pitcher's arousal level as it pertains to their pre-pitch routine could also be investigated.

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