Putting Athletes First: An Empirical Examination of the Hedonic Well-Being of College Student-Athletes in Response to NIL

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The purpose of the present investigation was to examine the expressions of hedonic emotions for student-athletes participating in NCAA Division 1 athletics during the period preceding the implementation of the NIL policy to the period succeeding the implementation of the NIL policy. The study obtains data from the Twitter profiles of 370 student-athletes participating in NCAA Division 1 athletics from January 2021 to December 2021 to examine the expressions of joy and anger as indicators of hedonic emotions. By leveraging a natural language processing-based emotion decomposition analysis coupled with difference-in-differences analysis, findings indicate that student-athletes competing in women’s sports express marginally more joy and anger compared to student-athletes participating in men’s sports after the NIL policy implementation. Findings reveal a double-edged impact, with a decrease in expressions of joy indicating concerns about the NIL policy’s potentially detrimental effects on student-athletes and a decrease in expressions of anger indicating optimism about opportunities presented by the policy.

**Keywords:** college sports, NIL policy, hedonic emotions, difference-in-differences design, natural language processing

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American college athletics commenced a new era on July 1, 2021, when the NCAA adopted new laws covering student-athletes’ names, images, and likenesses (i.e., NIL), paving the path for college student-athletes to financially gain from their athletic status (NCAA, 2021). The scholarly discourse on the NIL policy’s implementation has primarily focused on the legal components (Ehrlich & Ternes, 2021; Jessop & Sabin, 2021; McCarthy, 2020) and the monetary components (Cocco & Moorman, 2022; Messina & Messina, 2022). Although these investigations have been undertaken within the realms of the NIL policy, the larger revenue-generating college sports structure provides a useful context to understand the implications. Notably, Garthwaite et al. (2020) indicated that there are stark financial disparities between revenue-generating sports (e.g., football, men’s basketball) and nonrevenue-generating sports (e.g., swimming, tennis) in Power Five athletic programs at NCAA Division 1 level.

Given the financial disparities in college sports at the NCAA Division 1 level, it is reasonable to assume that not all student-athletes competing in different collegiate sports will earn an equal amount of money under the NIL policy. To support this claim, there are two arguments. First, the popularity of student-athletes competing in various collegiate sports is not equal to those participating in football who get the bulk of attention and spotlight (Garthwaite et al., 2020). Thus, corporations and other profit-seeking entities looking to capitalize on NIL policy’s perks will sign student-athletes with greater popularity among key marketing demographics. Second, the intra-team competition will be detrimental to student-athletes playing the same sport with the NIL policy, mostly benefiting the roster’s elite athletes or star players while having a negligible influence on other athletes. Due to these inequalities, it is plausible to argue that the differential levels of NIL compensation by college sports can differentially impact the hedonic emotions and well-being of student-athletes.

While a nascent stream of research has examined the well-being of student-athletes (Ryan et al., 2022), the literature remains limited and has not adequately considered the impact that NIL policy will have on the student-athletes beyond just those who become household names in football and men’s basketball (Dees et al., 2021; Harris et al., 2021). However, anecdotal evidence warrants an empirical investigation into how the implementation of the NIL policy affects the student-athletes’ hedonic emotions and well-being. For instance, the recent tragic incidents notably the deaths of three NCAA student-athletes, have not only drawn the public’s attention but also raised awareness about continuing issues surrounding the notions of hedonic emotions and well-being in intercollegiate sports (Doherty, 2022). Moreover, student-athletes who have their name, image, and likeness utilized by a business are subject to heightened scrutiny due to the amplified magnitude of responsibilities with enterprises leveraging the online followings of student-athletes to generate money (Harris et al., 2021). Notably, many studies have shown a correlation between student-athletes’ usage of social media and deteriorating mental health (Bunch & Cianfrone, 2022; Cutler & Dwyer 2020). Thus, student-athletes may crack under the pressure of excessive expectations brought on by the NIL endorsement agreements, thereby impacting their hedonic emotions and well-being.

Hedonic well-being refers to the subjective experience of pleasure and positive emotions (Ryan & Deci, 2001). Research has consistently shown that individuals with higher levels of hedonic well-being also report better mental health outcomes (Deci & Ryan, 2008). Hedonic well-being focuses on the immediate experience of positive affective states and the absence of negative affective states (Inoue et al., 2020). Extant research has consistently shown that individual expressions of hedonic emotions are closely associated with hedonic well-being and mental health outcomes (Zunic et al., 2020). Individual expressions of hedonic emotions indicate
the display of positive emotions, pleasure, and enjoyment by individuals as opposed to the display of negative affective states (Floyd et al., 2021). The present study focuses on examining the student-athletes’ expressions of joy (positive affective state) and anger (negative affective state) as measures of hedonic emotions. Notably, the present study employs a Natural Language Processing (NLP)-based emotion decomposition analysis and a difference-in-differences analysis to examine whether the student-athletes’ expressions of joy and anger demonstrated changes from a period preceding the implementation of the NIL policy to a period following the implementation of the NIL policy. Previous studies have implemented the NLP-based emotion decomposition analysis to measure expressions of hedonic emotions (Floyd et al., 2021; Lee, 2021).

In so doing, the present study makes the following contributions to the literature on intercollegiate athletics. First, the study represents an incipient effort to examine whether the changes in student-athletes’ expressions of hedonic emotions in the wake of NIL have varied effects on the type of sport in which the student-athlete participates, given that there is a presence of disparities in the revenues generated by different college sports at the NCAA Division 1 level. Studying the expressions of hedonic emotions can contribute to understanding the emotional responses and experiences of student-athletes given that the NIL policy represents a significant shift in the landscape of intercollegiate sports. Second, the study includes the NLP-based emotion decomposition analysis approach to analyze the longitudinal data from student-athletes’ Twitter profiles to examine the ebb and flow of student-athletes’ expressions of hedonic emotions over one year. Consequently, the longitudinal data provides a protracted time frame to analyze the changes in student-athletes’ expressions of hedonic emotions over one year and identify if heightened emotional reactions may have precipitated in student-athletes, thereby providing researchers with evidence to aid rational and evidence-based strategic planning and enhance the student-athletes’ expressions of hedonic emotions (Floyd et al., 2021).

The remaining sections of this paper are organized as follows. In Section 2, the appropriate literature review is presented. In Section 3, the research methods employed in the study are outlined. Section 4 presents the study’s results, while Section 5 elaborates on the study’s findings, implications, and describes the path for future research. Finally, section 6 concludes the paper by summarizing the study’s key findings.

**Literature Review**

**Student-Athlete Well-Being**

The concept of well-being is an important topic of scientific inquiry that has received considerable attention in psychology and sport management literature. People actively seek out opportunities to experience positive feelings as often and in as many facets of life as possible to experience a state of well-being (Ryan & Deci, 2001). When it comes to intercollegiate athletics, well-being has been widely studied in terms of its relationship with the student-athletes’ goal orientation, social connectedness (Wayment & Walters, 2017), life habits (DiBartolo & Shaffer, 2002), financial stress (Robb, 2017), injuries (Kleiber & Brock, 1992), mental health (Fogaca, 2021), and life satisfaction (Gabana et al., 2019).

**Transformative Sports Research Paradigm.** In the sport management field, Inoue et al. (2020) presented a transformative sports research framework that conceptualizes well-being as comprising the eudaimonic and hedonic dimensions. First, the eudaimonic dimension embraces aspects of the Aristotelian school of thought, which views well-being through the lens
of human expression and self-actualization (Waterman, 1993). While being referred to as a virtue-based exploration of consciousness (Ryff, 2017), the eudaimonic dimension consists of six main elements, including personal development, self-acceptance, life purpose, environmental mastery, happy relationships, and autonomy (Ryff, 1989). Second, the hedonic dimension of well-being focuses on the subjective expressions of pleasant emotive states (Grant et al., 2007), which individuals strive to maximize (Ryan & Deci, 2001). According to Kahneman (1999), a person’s sense of hedonic well-being may be described as a sequence of transactional events with polarly opposite good/bad components.

The transformative sports research framework provides a valuable lens for understanding the positive potential of sports. The present study is grounded in the transformative sports research framework and emphasizes the hedonic dimension of well-being. Specifically, the present study examines the expressions of hedonic emotions of student-athletes competing in NCAA Division 1 athletics. Hedonic emotions are a fundamental part of the human experience and the student-athletes’ expressions of hedonic emotions could provide valuable insights into student-athletes’ subjective expressions from the period preceding the implementation of the NIL policy to the period following the implementation of the NIL policy.

**Measurement of Student-Athletes’ Expressions of Hedonic Emotions**

Hedonic emotions have been measured in the literature by examining the prevalence of positive and negative emotive states (Di Fabio & Kenny, 2016). Fundamentally, emotions are affective states with a stronger and more intense subjective feeling evoked in response to a specific source and they engender a purposive component that impels an individual into taking action (Chen & Pham, 2019). Thus, it can be posited that different situations or events can elicit different emotional reactions, thereby impacting the hedonic well-being experienced by people. A fundamental question then arises: How many emotions (both positive and negative) are present that can be triggered and have an influence on people’s hedonic well-being? The research on primary emotions in the affective science domain can help in answering this question.

**Primary Emotions.** In the research on affective science, there are two viewpoints, including the biological perspective and the cognitive perspective. On one side, the biological perspective of emotions stresses the presence of primary emotions varying from two to ten (Reeve, 2014). The biological perspective’s underlying assumption is that there are a limited number of primary emotions that are common to all people, and they are manifestations of biology and development (TenHouten, 2017). Following the biological viewpoint, Stein and Trabasso (1992) highlight the emotions of sadness, fear, happiness, and anger since these emotions embody responses to life’s basic pursuits. Further, Ekman (1994) suggests that there are six distinct primary emotions, including enjoyment, disgust, contempt, anger, fear, and sadness present in humans because each of the six emotions corresponds to a different facial expression.

The cognitive perspective, on the other side, emphasizes that there is a range of emotions felt by humans and the number is certainly more than the 2 – 10 range as emphasized by the biological viewpoint (Reeve, 2014). Although acknowledging the existence of a finite range of neural circuits, the cognitive perspective proposes that emotions emerge in reaction to the context assigned to specific circumstances, with distinct emotions developing in response to diverse contextual situations. For example, Lazarus (1991) argues that the emotions elicited by individuals are dictated by whether their connection to the environment affects their well-being. By synthesizing the viewpoints of both perspectives, it can be posited that each primary emotion
consists of a family of associated emotions (Ekman, 1994). Anger, for example, is a primary emotion, but it also consists of a family of emotions that involves aggression, irritation, and frustration. Russell and Carroll (1999) proposed a model of the bipolarity of emotions that integrates the biological as well as cognitive perspectives on emotions and conceptualized emotions as comprising semantically opposite states of positive and negative affective experiences. Principally, the positive affective state refers to pleasant experiences encountered by individuals, while the negative affective state refers to unpleasant experiences encountered by individuals. In addition to the valence of the affective states, the model proposes that arousal or activation is also an important component of emotion (Russell & Carroll, 1999). For instance, the emotions of joy and anger can be categorized into a cluster of positive and negative valence states respectively, that are high on arousal.

**Hedonic Emotions.** The present study emphasizes the notion of hedonic emotions that are triggered in response to events that are intrinsically motivating to people (Holbrook et al., 1984). Expressions of hedonic emotions are fundamental components of human communication that play an important role in people’s lives as they help convey the sentimental value of subjective experiential states (Ding & Tseng, 2015). Previous studies conducted in the domains of sport management have conceptualized the hedonic emotion of joy as representing positive affect and the hedonic emotion of anger as representing negative affect (Jensen et al., 2016; Jones et al., 2012; Koenigstorfer et al., 2010; Tobar, 2006; Wann & Schrader, 1997). Hedonic emotion of joy is associated with feelings of happiness and pleasure (McCarthy, 2011) while the hedonic emotion of anger is associated with feelings of hostility and aggression (Maxwell, 2004).

The elicitation of joy potentiates energizing action that provides the motivational resources to have a positive impact on people’s lives (Johnson, 2020). Conversely, elicitation of anger indicates aversion, expressing an approach undertaken to convey vexation leading to negative thoughts and behaviors (Sofía & Cruz, 2016). Collectively, joy and anger represent the semantically opposite states of positive and negative affective experiences. The present study includes the hedonic emotions of joy and anger to examine the sentimental expressions of student-athletes participating at the NCAA Division 1 level. Notably, the present study measures the expression of hedonic emotions by utilizing the social media platform as it provides a public channel to express hedonic emotions on a variety of topics to reach a large audience.

**Social Media and Expression of Hedonic Emotions.** The link between social media and hedonic well-being is intricate and multidimensional (Kross et al., 2021), influenced by aspects like how people use social media, the amount of content they consume, and the amount of time they spend online. Social media provides a forum for people to interact with like-minded groups (de Oliveira Santini et al., 2020), express their opinions (Valsesia et al., 2020), and seek opportunities for social support (Kim, 2014), all of which can lead to improved well-being. Yet, the growing use of social media has negative effects such as decreased self-esteem (Woods & Scott, 2016), decreased life satisfaction (Barry et al., 2022), increased procrastination (Brougham, 2021), and feelings of worry and discontent (Dhir et al., 2018).

In recent years, student-athletes have increasingly turned to social media as a way to broadcast their hedonic emotions to a broader audience. David et al. (2018) evaluated the impacts of social media on the well-being of NCAA Division 1 student-athletes. The results indicated that student-athletes experienced increased anxiety symptoms due to public scrutiny and criticism. Floyd et al. (2021) examined the hedonic emotional responses elicited by NCAA Division 1 student-athletes on social media during the COVID-19 pandemic. The findings
indicated that the student-athletes most frequently expressed joy, trust, anticipation, and fear, while also expressing strong negative sentiments such as fear and anxiety about the pandemic and other significant contemporary events. The present study examines the student-athletes’ expression of hedonic emotions on social media from the period preceding the implementation of the NIL policy to the period following the implementation of the NIL policy.

NIL: A New Landscape in College Sports

Kunkel et al. (2021) estimated that top athletes like former Alabama quarterback Tua Tagovailoa, who boasts 544,000 Instagram followers, could earn over $25,000 per sponsored post through the NIL policy, while less famous athletes with smaller followings might earn only a small fraction of that amount. Student-athletes with substantial social media followings and commensurate NIL income potential have experienced the convenience of not having to decide between establishing a sporting career and exploring a different profession (Kirshner, 2021). Given that the NIL deals require a significant amount of additional labor from student-athletes, they can face additional psychological pressure to capitalize on a fleeting window of athletic marketability, especially athletes in sports without robust professional opportunities. Student-athletes are more valuable when they are more recognizable to fans, and the most recognizable athletes are those that frequently play in front of large crowds in the sports that drive the bulk of fan interest. Lanter and Hawkins (2013) found that football, and men’s basketball account for the majority of ticket sales and media rights revenue, thereby, typically consistent in generating profits. As a result, these sports are often referred to as “revenue sports,” while all other sports are referred to as “nonrevenue sports” (Garthwaite et al., 2020, p. 1).

The present study focuses on the four categories of sports (football, men’s basketball, other men’s sports, and women’s sports) based on Garthwaite et al.’s (2020) empirical research published in the National Bureau of Economic Research. Student-athletes in football and men’s basketball are expected to profit from NIL more than those in other men’s sports and women’s sports. Preliminary data on the volume and magnitude of NIL rules have supported this notion, with the revenue sports (football and men’s basketball) accounting for 38% of total NIL deals and 66% of NIL financial compensation (Opendorse, n.d.). Outside of scholarly literature, several athlete advocacy groups have also expressed concerns regarding female athletes having comparatively few NIL opportunities due to the female athletes’ lack of marketability relative to the highly marketable athletes in football and men’s basketball (The Drake Group, 2022).

As this section has demonstrated, there is preliminary evidence to suggest that student-athletes in other men’s sports and women’s sports have experienced lesser benefits of new NIL policies as compared to those in football and men’s basketball, which could consequently impact the expressions of hedonic emotions. Based on the above discussion, the present study proposes the following research question:

RQ 1: For student-athletes participating in NCAA Division 1 athletics, what are the changes (if any) in expressions of hedonic emotions of joy and anger from the period preceding the implementation of the NIL policy to the period following the implementation of the NIL policy?
Methods

Empirical Strategy

The purpose of the present empirical investigation was to examine the expressions of hedonic emotions (i.e., joy and anger) for student-athletes’ participating in NCAA Division 1 athletics. The present study utilized Twitter as a social media channel to obtain information on the expressions of hedonic emotions. Specifically, we employed a data scraping procedure to obtain Tweets from the Twitter profiles of 370 student-athletes participating in NCAA Division 1 athletics. To examine the expressions of joy and anger, the present study incorporated the NLP-based emotion decomposition analysis which employs algorithms to extract and evaluate sentiments from textual data to understand people’s emotions toward specific events (Fang & Zhan, 2015). After performing the analysis, we obtained a raw count of the expressions of joy and anger which were graphically plotted along a longitudinal period to examine the ebb and flow of expressions of hedonic emotions for the four categories of sports. We then implemented the difference-in-differences analysis to examine whether the expressions of joy and anger changed from a period preceding the implementation of the NIL policy to a period following the implementation of the NIL policy. As a measure of robustness check, we calculated and graphically illustrated the percentage of emotions expressed along a longitudinal period based on the total tweets for each sport.

Sampling Strategy

Given the revenue-generating structure of intercollegiate athletics, we decided to include football and men's basketball as revenue-generating sports, and other men’s sport and women’s sports as non-revenue-generating sports. As an important constituent of this intercollegiate athletics ecosystem, we decided to emphasize the student-athletes participating in the aforementioned college sports because the fundamental underpinnings of the NIL policy directly involve the intercollegiate student-athletes, who can use their name, image, and likeness to generate income. Following this premise, the present study includes six major sports for examining the proposed research question. In terms of revenue sports, football and men’s basketball were selected, since they represent the only two sports presenting a profit over the past two decades (Garthwaite et al., 2020). Hart (2021) reports that baseball and men’s track and field were the leading men’s sports in terms of NIL activities, after football and men’s basketball. As a result, baseball and men’s track and field were chosen to represent other men’s sports categories to examine whether the expressions of hedonic emotions followed a different (or similar) pattern as compared to football and men’s basketball. In addition, women’s volleyball and women’s basketball were selected to represent women’s sports since student-athletes competing in these sports were extensively involved in the NIL activities (Guzior, 2022; Hart, 2021). It was decided to include an equal number of sports under other men’s sports and women’s sports categories to counterbalance the impact of gender as a confounding variable in the nonrevenue sports category. Thus, a sample of the student-athletes participating in the above-mentioned six sports at the NCAA Division 1 level was included in the present study. A total of 370 college athletes from the Power Five conferences (i.e., ACC, Big Ten, Big 12, Pac-12, and SEC) were sampled in the present study. The decision was made to sample student-athletes from the Power Five conferences since these conferences include prominent sporting colleges and student-athletes from these colleges are projected to profit from the NIL policy (Wittry, 2021).
The following three criteria were implemented to sample student-athletes in the present study. First, an athlete had to own a personal Twitter account from which tweets were sent during the 2021 calendar year, thereby making them active on Twitter. The existing literature on intercollegiate athletics has employed Twitter to investigate the attitudes and sentiments of student-athletes (David et al., 2018; Dittmore et al., 2013; Sanderson et al., 2014). Given its potential to facilitate personalized communication and enable student-athletes to promote causes they are passionate about (Yan et al., 2018), Twitter was deemed as a viable data collection platform in the present study. Considering that the current research employs Twitter for data collection, it was deemed suitable to incorporate student-athletes who actively participate in or interact with Twitter. Second, athletes were randomly sampled from their leagues’ all-conference teams for the 2021 season (i.e., 1st, 2nd, and 3rd teams). Finally, each athlete in the sample had to be an active intercollegiate athlete during the 2021 year, and not have turned professional during this timeframe. It is relevant to note that the disparities in the number of players on the roster, as well as on the playing field (e.g., football as compared to basketball), created disparities in the final sample. The final sampling distribution of the student-athletes was as follows: 100 for football, 70 for men’s basketball, 50 for men’s baseball, 50 for men’s track and field, 50 for women’s volleyball, and 50 for women’s basketball.

Data Collection

The data were collected using a data scraping technique using the “rtweet” tool (Kearney, 2019) in R, version 4.1. In particular, the full social media timeline on Twitter for all the 370 student-athletes was scraped using their Twitter usernames. This operation was performed using one of the authors’ academic Twitter Application Programming Interface (API) accounts who oversaw data collection. Since this research mainly focuses on the year 2021 during which the NIL policy was adopted, the tweets’ timestamps were then filtered to maintain only the postings made between January 1, 2021, and December 31, 2021. After scraping and filtering the tweets for the six sports of interest, 73,964 tweets were obtained. The resultant data was then filtered to retain relevant variables, including the Twitter handle, timestamp, raw text, and the number of likes, retweets, and quotes.

Natural Language Processing (NLP) and Emotion Decomposition Analysis

NLP refers to the process of extracting valuable and meaningful data from text (Gupta & Lehal, 2009). A step-by-step data-cleaning approach was executed with the removal of superfluous white spaces, converting text to lowercase, removing numerals and special symbols, removing punctuation, and omitting frequent English stop words. These stop words are a collection of lexicons that provide minimal value and significance while analyzing the emotions of individuals. A corpus was produced by processing the textual data and executing the six specified normalizations and transformations. To return derivational and idiomatic expression forms of a word to its root form, a stemming and lemmatization technique was devised. To assist the forthcoming analysis, a document-term matrix was generated once the corpus was cleaned up. The present research used the NLP-based emotion decomposition analysis to identify the expressions of joy and anger expressed in the textual data (Bravo-Marquez et al., 2019). This method has the benefit of using the vocabulary of the text and determining the frequency of frequently occurring words to quantify the intensity of emotions. Further, a score was given to the lexicon-related parts of the textual data based on the frequency of words to determine the frequency with which the emotions of joy and anger were conveyed in the textual data (Floyd et
Table 1 provides an example of emotion attribution for joy and anger based on student-athletes’ Tweets.

### Table 1

<table>
<thead>
<tr>
<th>Tweet</th>
<th>Emotion</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>“This was a miserable loss”</td>
<td>Anger</td>
<td>1</td>
</tr>
<tr>
<td>“Thankful to be on this team”</td>
<td>Joy</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. Italicized words are the ones being considered for elicited emotions.

**Difference-in-Differences Analysis**

The use of difference-in-differences (DiD) design as a credible quasi-experimental assessment approach is becoming more prevalent (Athey & Imbens, 2022). When panel data are available for evaluations of treatment effects, DiD estimation is often employed. Further, DiD helps in facilitating research analysis when unobserved heterogeneity could complicate the establishment of the relationship between treatment and outcome (Angrist & Pischke, 2009). DiD is an effective way to estimate the effects of new policies. To implement DiD, the existence of a threshold is crucial as it allows the researchers to examine the effectiveness of a policy intervention by comparing the changes in parameters before and after the implementation of the policy. Further, the DiD framework also helps evaluate the effects of policy intervention on different heterogeneous groups in the population. To be precise, the DiD technique compares the average change in time in the outcome variable for various groups of the treatment variable to determine the impact of a treatment on an outcome (Athey & Imbens, 2022).

As noted previously, the NIL policy was implemented by the NCAA on 1st July 2021. This represents the threshold for the analysis that provides a quasi-experimental setup to identify student-athletes’ expressions of hedonic emotions in a standard DiD research design. This means that we are comparing the change in the expressions of joy and anger before and after the introduction of the NIL policy in the four categories of sports (football, men’s basketball, other men’s sports, and women’s sports). To control the influence of social media engagement metrics on the expressions of joy and anger, the study included the number of likes and retweets for each Twitter post as covariates. Social media engagement metrics were selected as covariates because prior research has shown that engagement on social media can generate NIL value, which may have an impact on expressions of hedonic emotions (Kunkel et al., 2021).

**Model Specification.** To estimate the changes in student-athletes’ expressions of hedonic emotions from the period preceding the implementation of the NIL policy to the one succeeding the implementation of NIL policy, the following equation was utilized for the analysis:

\[ Y_{it} = \alpha_i + \beta_1 \text{(Participated\_Sports)}_t + \beta_2 \text{(NIL\_Enactment)}_t + \beta_3 \text{(Participated\_Sports)}_i \cdot \text{(NIL\_Enactment)}_t + \beta_4 \text{Controls}_{it} + \varepsilon_{it} \]

Where i indexes the two emotional sentiments and t refers to six months leading up to and six months after the enactment of the NIL policy on July 1st, 2021. \( Y_{it} \) is the aggregated monthly expressed sentiment score conveyed by each selected student-athletes.
Participated_Sports defines a dummy variable that equals 1 if a student-athlete participates in other men’s sports, 2 if men’s basketball, and 3 if college football, whereas zero indicates the baseline if participating in women’s sports. NIL_Enactment is another dummy variable that equals 1 if the period is after the implementation of the NIL policy (i.e., from 1st July 2021 to 31st December 2021), and zero else. Following the previous literature, control variables include measures (e.g., count of likes and retweets) that gauge the level of social interactivity that a student-athlete might be involved with. Finally, $\epsilon_{it}$ is a robust residual term that captures unobserved individual and time heterogeneities that might influence the change in a student-athletes’ expressions of hedonic emotions.

Results

Table 2 provides information on the summary statistics of covariates (i.e., the number of likes and retweets) for each of the categories of sport sampled in the study. In terms of organic posts, both football and men’s basketball showcase a higher count of likes and retweets than the other two categories of sport (i.e., other men’s sports and women’s sports). This pattern is observed once again for likes when it comes to the shared posts retweeted or quoted by the student-athletes, with football having the higher number ($n = 1,113,710$). However, the count of retweets does not follow the above-mentioned pattern in terms of shared posts, with women’s sports displaying the highest number of retweets ($n = 70,281,264$), followed by football ($n = 36,108,143$), other men’s sports ($n = 31,180,167$), and men’s basketball ($n = 12,470,696$). Therefore, we observe two different trends in the way student-athletes like and retweet on Twitter, following the revenue/nonrevenue generating divide, and the other highlighting women’s sports as being the most prolific, especially in terms of shared posts.

Table 2
Summary Statistics for Covariates

<table>
<thead>
<tr>
<th></th>
<th>Likes</th>
<th>Retweets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Organic Posts</td>
<td>Shared Posts</td>
</tr>
<tr>
<td>Football</td>
<td>1,765,700</td>
<td>1,113,710</td>
</tr>
<tr>
<td>Men’s Basketball</td>
<td>1,986,256</td>
<td>654,962</td>
</tr>
<tr>
<td>Other Men’s Sports</td>
<td>934,963</td>
<td>392,173</td>
</tr>
<tr>
<td>Women’s Sports</td>
<td>188,053</td>
<td>137,196</td>
</tr>
</tbody>
</table>

Note. Organic Posts refer to the posts created by the student-athletes themselves, Shared Posts refer to the posts that were retweeted or quoted by the student-athletes.

Figure 1 illustrates the results of emotion decomposition analysis for anger based on the raw count and percentage of total tweets. Based on the graph for emotion decomposition analysis for the raw count of anger, we observe a downward trend in anger among student-athletes playing in men’s basketball, other men’s sports, and women’s sports, but an upward trend among those competing in football. In the context of student-athletes playing football, we see an initial surge in anger in January, which declines in February and reaches a plateau near July. In addition, there is a rise in anger from August through December. This increase coincides with the
prime of the football season when a variety of emotions are exhibited by student-athletes about their performance (Floyd et al., 2021; Nicholls et al., 2012). A comparable increase may be noticed for student-athletes playing women’s sports and men’s basketball during March and April when both men’s and women’s basketball seasons along with the March Madness are in full swing, and from October to December when the women’s volleyball season is in full swing. For student-athletes playing other men’s sports, we detect an increase in anger in May, followed by a decline in anger expressions until December. If we compare the expression of anger in July and August immediately after the adoption of the NIL policy, we notice a drop from July to August for all four categories of sports. Further, for the graph for emotion decomposition analysis based on the percentage of total tweets, we observe a similar pattern, except for the degree of expressions of anger for student-athletes playing other men’s sports is greater than the other three sports categories from May to August.

Figure 2 illustrates the results of emotion decomposition analysis for joy based on the raw count and percentage of total tweets. Based on the graph for emotion decomposition analysis for the raw count of joy, we can observe an upward trend in joy for student-athletes participating in football, a relatively flat trend line for those competing in men’s basketball and other men’s sport, and an intermittent waxing and waning of joy for those participating in women’s sports. Specifically for student-athletes playing football, we detect an increase in joy in July and again from September through December, coinciding with the peak of the football season. For student-athletes playing women’s sports, we see a spike in March and April, followed by a rise from October to December, coinciding with the peaks of the basketball and volleyball seasons. In addition, for student-athletes playing men’s basketball, we notice a rise in joy in March and April, coinciding with the height of March Madness, and again a rise in July. For the other months, the trend line appears to be quite flat. Except for the period from May to July, we notice a somewhat flat trend line for student-athletes playing other men’s sports. As a result of the revenue-generating characteristics of football and men’s basketball in intercollegiate sports, there is an increase in happiness in July for student-athletes playing in football and men’s basketball, which points to the possible NIL advantages that student-athletes playing in these sports may enjoy. Further, the graph for emotion decomposition analysis based on the percentage of total tweets indicates that the slope of the line for other men’s sports is steeper from July to August indicating a sharp decline in sentiments of joy following the adoption of the NIL policy. Also, in July, the degree of joy expressed by student-athletes playing football is less than those playing men’s basketball when considering total tweets which is the opposite when considering the raw count of anger.

Table 3 reports the results of DiD analysis. Model 1 uses the count of emotion joy as the dependent variable and Participated_Sports, NIL_Enactment, and interaction between Participated_Sports and NIL_Enactment as independent variables. The analysis is then repeated in Model 2 by adding covariates (i.e., the number of likes and retweets). Findings in both the models (i.e., Models 1 and 2) show a similar pattern. Notably, the findings reveal that the interaction between the Participated_Sports and NIL_Enactment variables is significant indicating that the NIL policy implementation influences the expressions of joy for student-athletes competing in the four categories of sports.

Besides, Model 2 indicates that the number of likes and retweets does not have any influence on the level of joy experienced by student-athletes competing in the four categories of sports. Further, the results reveal a non-significant negative association between the Participated_Sports variable and the emotion of joy. This indicates that the student-athletes competing in women’s sports experience marginally more joy (although not significant) compared to student-athletes participating in other men’s sports, men’s basketball, and football.
Figure 1.
Results of emotion decomposition analysis for anger
Figure 2.
Results of emotion decomposition analysis for joy
This finding substantiates the statement that male student-athletes received a higher chunk of the NIL deals, but female student-athletes received better NIL deals (Hunzinger, 2022). Moreover, the results reveal a significant negative association between the NIL_Enactment variable and the emotion of joy. This indicates that the student-athletes’ expressions of joy after the implementation of the NIL policy were less than the expressions of joy before the implementation of the NIL policy. This finding substantiates the widespread despondence among the various strata of student-athletes competing in different college sports surrounding the pitfalls of NIL policy implementation and the subsequent decisions to transfer to schools that offer better NIL deals (Priester, 2022; Uggetti, 2022).

Table 3
Results of the Difference-in-Differences Analysis

<table>
<thead>
<tr>
<th></th>
<th>Joy</th>
<th>Anger</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td>Participated_Sports</td>
<td>-33.08</td>
<td>74.38</td>
</tr>
<tr>
<td></td>
<td>(-0.78)</td>
<td>(-1.34)</td>
</tr>
<tr>
<td>NIL_Enactment</td>
<td>-247.40*</td>
<td>-247.40*</td>
</tr>
<tr>
<td></td>
<td>(-2.99)</td>
<td>(-2.99)</td>
</tr>
<tr>
<td>Participated_Sports*NIL_Enactment</td>
<td>169.68*</td>
<td>169.68*</td>
</tr>
<tr>
<td></td>
<td>(3.83)</td>
<td>(3.83)</td>
</tr>
<tr>
<td>Number of Likes</td>
<td>--</td>
<td>0.01 (1.37)</td>
</tr>
<tr>
<td>Number of Retweets</td>
<td>--</td>
<td>0.01 (1.49)</td>
</tr>
</tbody>
</table>

*p < 0.05

Furthermore, Models 3 and 4 use the emotion of anger as a dependent variable. Model 3 uses Participated_Sports, NIL_Enactment, and interaction between Participated_Sports and NIL_Enactment variables as independent variables. Model 4 repeats the analysis by including the covariates (i.e., the number of likes and retweets). Findings in Models 3 and 4 show a similar pattern. Particularly, the findings reveal that the interaction between Participated_Sports and NIL_Enactment variables is significant indicating that the NIL policy implementation influences the expressions of anger by student-athletes competing in the four categories of sports. Besides, Model 4 indicates that the number of likes and retweets does not have any influence on the level of anger experienced by student-athletes competing in the four categories of sports.

Furthermore, the results reveal a non-significant negative association between the Participated_Sports variable and the emotion of anger. This suggests that student-athletes participating in women’s sports express marginally more anger compared to student-athletes competing in men’s sports, possibly indicating relative antagonism towards possible gender-based disparities caused by the adoption of the NIL policy and the subsequent NIL contracts. Moreover, the results reveal a significant negative association between the NIL_Enactment variable and the emotion of anger. This indicates that the student-athletes’ expressions of anger after the implementation of the NIL policy were less than the expressions of anger before the implementation of the NIL policy. This suggests that student-athletes were optimistic about the changes that will transpire in the college sports ecosystem because of the adoption of the NIL policy.
Discussion

The present study investigates student-athletes’ expressions of hedonic emotions from the period preceding the implementation of the NIL policy to the period following the implementation of the NIL policy. The results of the study indicate that the interaction effect between the Participated_Sports and NIL_Enactment variables was significant for both the emotions of joy and anger expressed by the student-athletes on social media. More specifically, it indicates that the student-athletes’ expressions of joy, as well as anger, decreased in the period after the implementation of the NIL policy. Notably, student-athletes’ expressions of their hedonic well-being declined following an ostensibly positive development, namely their potential to benefit from their hard work and subsequent athletic reputation. This might be due to several factors, including the discontent of athletes who have not profited from NIL deals or who have benefited less than their colleagues and peers (i.e., other athletes at their school or in their conference); in other words, some athletes might interpret NIL as an exacerbation of pre-existing disparities in resources and support. With some athletes reportedly signing multimillion-dollar contracts, such as University of Tennessee quarterback commit Nico Iamaleava, it is possible that less fortunate players (including those who sign NIL contracts but on a smaller scale) may feel resentful of the stratified nature of NIL and that their emotions may subsequently leak onto their social media platforms (Staples, 2022).

However, it is important to note that Twitter’s typical engagement metrics were not significant covariates as they did not significantly affect the relationship between the independent variables (i.e., Participated_Sports, NIL_Enactment, and interaction between Participated_Sports and NIL_Enactment) and the observed expressions of joy and anger. This is an interesting contrast to Kunkel et al. (2021), who posited that overall following, and engagement would be the primary determinants of how adopting the NIL policy would benefit college athletes. Our results indicate that the athletes who receive the most engagement are not significantly more joyful or significantly less angry than those who receive less engagement. This could indicate that the stratification of NIL benefits conferred on athletes in various sports is not as severe an impediment to the expressions of hedonic emotions. If the NIL policy negatively impacts the hedonic well-being of student-athletes, it appears to be doing so universally rather than disproportionately impacting student-athletes in less marketable sports.

While the associations between the Participated_Sports variable and the two focal emotions, joy and anger, were not statistically significant, it is interesting to note that athletes in women’s sports expressed more joy than those in men’s football, basketball, and other men’s sports. While this finding does not diminish the structural issues present within the NCAA and its governance of women’s sports, it does suggest that NIL policy has not differentially impacted the expressions of hedonic emotions in different sports. Moreover, the NIL policy may have even had a slight positive effect on the expressions of hedonic emotions of athletes in women’s sports.

However, when the results from July are specifically examined, we find that both football and men’s basketball saw a moderate spike in expressions of joy, whereas the nonrevenue sports remained relatively steady from June. Given that men’s basketball season runs from November through April, and football season runs from late August until January, it is unlikely that this spike in joy is derived from seasonality. While the initial spike in joy dissipates in August, it is possible that athletes in these revenue sports were initially more optimistic about the possible opportunities presented by NIL than athletes in nonrevenue sports. This would align with the predictions of Kunkel et al. (2021) as well as the predictions that were widely shared by public media coverage of the early months of NIL.
The aggregated data on NIL compensation does indicate a significant disparity in the NIL opportunities available among the four sport categories (Opendorse, n.d.), but that disparity has not been as cavernous as the worst-case scenarios that some anticipated (Associated Press, 2020), with several athletes in nonrevenue sports signing handsome deals. However, the landscape of intercollegiate sport after the implementation of the NIL policy is rapidly evolving, and one development that could radically alter the dynamics that student-athletes face is the rise of “NIL collectives,” or pools of money raised by fans and boosters of a program for the express purpose of NIL deals for athletes. Many of these collectives are used to guarantee money to student-athletes based not on the potential return on investment but rather based on their potential positive contributions to their team’s success. Given the heightened booster interest in revenue sports, many envision a future where these collectives effectively act as “pay-for-play” salary guarantees for athletes on the most prominent teams, and as a recruiting enticement. College administrators have expressed extreme concern about the disruptive effect that collectives might have on the landscape of college sports, and as boosters from more universities move to adopt these collectives, it could heighten the disparity between the four categories of sports.

Theoretical Implications

The present study contributes to the burgeoning scholarship that has examined the impact of social media on the well-being of student-athletes. The findings of the study can contribute to theorizing about how student-athletes employ social media to express hedonic emotions in the social world. With the adoption of the NIL policy, the role of social media for brand development is bigger than ever for student-athletes to increase their marketability and earnings potential (Cocco & Moorman; 2022; Kunkel et al., 2021). The results of this study indicate that the student-athletes’ expressions of joy, as well as anger, decreased in the period after the implementation of the NIL policy indicating the possibility of social media usage acting as a double-edged impact. On one hand, student-athletes may use social media to share their experiences and build their brands to attract fans and recruiters by offering positive thoughts and attitudes. On the other hand, the increased focus on social media and brand building could lead to increased pressure and a competitive environment for student-athletes where they have to constantly perform and put on a show, which can take a toll on their well-being.

In the context of the transformative sports research paradigm, analyzing the expressions of hedonic emotions for student-athletes competing in NCAA Division 1 sport offers insights into mental health and hedonic well-being. The present work outlined how expressions of hedonic emotions changed between the period preceding and following the implementation of the NIL policy. The results of this study provided insights to appreciate the dynamic, evolving, and the transformational character of student-athletes’ hedonic emotions and provided a longitudinal lens through which theorizations of hedonic well-being can be conducted in intercollegiate athletics. This is especially noteworthy given that the topic of student-athlete well-being has been a focus of academic research since the establishment of the NIL policy (Harris et al., 2021).

Managerial Implications

The results of the present study about student-athletes’ expressions of hedonic emotions can have several implications for both intercollegiate athletics administrators and sport management practitioners. It is relevant to note the potential use of the findings towards the
elaboration of the NLP tool designed to better understand student-athletes and their journeys with NIL. More specifically, NLP models could help to predict student-athletes’ expressions of hedonic emotions, and therefore their well-being states about different life events (Floyd et al., 2021). Identifying and analyzing the expressions of hedonic emotions would indeed be extremely valuable for administrators to anticipate potential negative emotions and behaviors about major changes in the intercollegiate athletics landscape, such as the newly implemented NIL policy.

The athletic directors, coaches, and support staff may utilize the NLP-based emotion decomposition analysis to quantify the expressions of hedonic emotions from the student-athletes’ social media postings to monitor their mental health and hedonic well-being (Floyd et al., 2021). Given that the student-athletes’ expressions of hedonic emotions can be mapped along a longitudinal timeline, the athletic directors, coaches, and support staff could identify sources that elicit negative hedonic emotions. Based on this information, student-athlete-centered interventions such as mental toughness training and individual counseling could be developed to help build resiliency and mitigate the negative impact of stressors on student-athletes.

The findings indicate a double-edged effect related to the implementation of the NIL policy in terms of student-athletes’ expressed emotions, which should be considered very carefully by athletic administrators. The results reveal a decrease in expressions of joy in the period after the implementation of the policy, thereby indicating an avenue for administrators to take into consideration when it comes to guiding student-athletes in their NIL journey. This is consistent with the ongoing circulating concerns targeting NIL deals for their potential negative effects on student-athletes (e.g., stress, and financial exploitation) despite the undeniable financial potentiality of such a policy for these individuals (Moglia, 2021). Ultimately, the findings support potential shortcomings of NIL policy on student-athletes, forcing them to function in a business capacity and therefore inevitably leading to losing their focus on getting an education and playing at a high-level (Coyle, 2022).

Brands are also positioned to be important beneficiaries of the recently implemented NIL policy, allowing student-athletes to feature in their commercial and advertisement campaigns for profit. Specifically, brands highlighting student-athletes for their endorsements turn out to be more appealing to consumers, implying tangible benefits for these companies to hire student-athletes using the NIL policy (Smith & Broughton, 2021). Consequently, industry managers need to focus on student-athletes’ hedonic well-being to put these individuals in an advantageous position to represent their brands. Student-athletes’ hedonic well-being remains the primary focus for the administrators involved in intercollegiate athletics, especially after introducing the NIL policy (Uggetti, 2022). While our analysis provides evidence regarding the expressions of hedonic emotions by the student-athletes’, there is still a notable need for careful consideration and education at all levels to ensure the student-athletes’ best interests (Coyle, 2022).

Limitations and Future Directions

Five primary categories of limitations are identified that are inherent in the present study: (1) limitations inherent to NLP and machine learning, (2) limitations of social media analysis more broadly, (3) the potential confounding effect of seasonality, (4) limitations specific to NIL and the contemporary dynamics of intercollegiate sport, and (5) limitations inherent to the sample chosen for this study. First, while lexicon-based NLP algorithms have improved markedly in recent years with the evolution of technology and increasing processing power (Chowdhary, 2020), these algorithms still struggle to accurately capture linguistic quirks such as sarcasm or contextual vernacular. For example, if someone watching the Los Angeles Lakers
tweeted out “LeBron James is a bad man” after a particularly impressive performance, the NLP algorithm would likely code it as a negative emotional expression, despite the tweet being one of endearment. While these obstacles are theoretically surmountable given an advanced deep neural network and sufficient training data, those developments have yet to be accomplished.

Second, social media data itself is a space of contestable representations and questionable authenticity (Wellman et al., 2020). Particularly, one’s social media presence, plausibly, can be easily and thoroughly curated. In this sense, it can be argued that there is no guarantee that sentiments and emotions posted on social media perfectly represent the disposition of the poster. This can manifest in several ways, such as athletes curating their presence by deleting posts that prompt a backlash or undesirable discourse, or by self-censoring to meet conduct standards set either by their institution or by public opinion. Additionally, discussing Twitter more specifically, users are limited to 280 characters, which could influence the opportunities available for emotional expression. Third, there could be a significant seasonality effect on the social media usage of student-athletes. For instance, athletes might express more joy during a successful season, or more anger during a losing season. Such a phenomenon would explain why the number of tweets expressing both anger and joy spiked between September and December (the peak months of the college football season).

Fourth, the modern landscape of college sports, specifically as it relates to NIL, is evolving every day. Our project represents student-athletes’ experiences with NIL in 2021, yet NIL has already undergone huge changes that might profoundly change their experiences and emotional disposition. Many top college football schools employ NIL collectives to compensate recruits and players. These collectives are unaffiliated with colleges, yet they may function as “pay-for-play” syndicates that compensate outstanding football and basketball players (Auerbach, 2022). Fifth, the design of this study was limited in its focus on student-athletes from Power Five conferences at NCAA Division 1 level. While there is ample evidence supporting the idea that these athletes will be the primary beneficiaries of NIL, they are not representative of the entire spectrum of intercollegiate athletics. Rather, they represent a subpopulation of NCAA Division I athletes that were deemed most likely to engage with NIL. Future studies should consider expanding on this study by sampling athletes from outside the Power Five conferences (e.g., athletes from the so-called mid-major and low-major conferences).

Future research on NIL and its effects on student-athlete well-being should consider these limitations. Additionally, future research might expand upon the sports covered in the present investigation. Another potential avenue for future research could be to explore the impact of NIL policy enactment on the gender inequities inherent in college sports. Lastly, in terms of methodology, future studies might consider exploring athletes’ experiences with NIL in greater depth using qualitative inquiry including semi-structured interviews, survey methodology, and experimental design. These studies could produce insights into meaningful aspects of NIL for athletes and explanations for changes in hedonic emotions.

Conclusion

As intercollegiate sports transition into a new era, there will be a great deal of discussion over the financial and legal implications of the NIL policy. Nonetheless, it is equally crucial to prioritize the hedonic well-being of student-athletes as they acclimate to the new developments in intercollegiate athletics due to the introduction of the NIL policy. The present research presents empirical evidence to illustrate that the adoption of the NIL policy has varying impacts on the student-athletes participating in different categories of college sports at NCAA Division 1 level in terms of their hedonic emotions, as evaluated using the expressions of joy and anger.
expressed on social media (i.e., Twitter). In so doing, the research offers sports management academics and athletic administrators with valuable insights on how to properly monitor the emotions of student-athletes to promote and improve their hedonic well-being.

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