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Playing with Pain: Social Class and Pain Reporting among College Student-Athletes

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ABSTRACT

Socio-economic class affects a variety of health outcomes – this includes the experience of pain. Little work, however, explores how class affects pain experiences of college student-athletes. This gap is notable given injuries frequently occur in this population. We argue that lower class student-athletes will ironically be more likely to experience pain but less likely to report it. We find evidence for this claim with a large survey of student-athletes from a major National College Athletic Association conference. We further present evidence that class may influence pain reporting via identity, experiential, and social pathways. Our results highlight how potentially vulnerable student-athletes may "play with pain." The findings also suggest that practitioners should pay particular attention to self-reports of pain by lower class student-athletes.

Keywords: Athletic injury, Pain, College athletics, NCAA, Socio-economic class, Sports medicine

INTRODUCTION

"No pain, no gain." "Play through the pain." These are common retorts when an athlete injures him- or herself. Yet, ignoring pain can have severe consequences for one's long-term performance, health, and overall well-being. It is thus not surprising that scholars and practitioners have paid particular attention to the causes and consequences of pain (16). Scholars have identified a host of factors that influence pain perceptions (35) and pain reporting in different domains (12). Yet, we are unaware of any work on the correlates of pain self-reports among college student-athletes. How do these individuals experience pain, and what factors account for variation? Moreover, which of these student-athletes are more or less likely to report pain? Sports medical personnel often rely on self-reports when caring for student-athletes (28) – knowing the factors that lead to under-reporting would allow practitioners to be vigilant and potentially preempt long term student-athlete health problems.

In what follows, we first discuss pain reporting. We explain why college sports presents a unique domain where socio-economic class may affect pain reports. We then test our predictions with a novel data collection from a large sample of Division 1 National Collegiate Athletic Association (NCAA) student-athletes. Our results reveal a troubling paradox such that those who identify as being lower or working class anticipate experiencing more pain but also are likely to under-report the extent of the pain. We conclude with a discussion of implications and suggestions for future work.

Socio-Economic Status and Pain

Lower socio-economic status leads to poorer health outcomes – as one's socio-economic status increases, one's health improves (1). Chen and Miller (7) state, "Pervasive and striking disparities in physical health outcomes exist by socioeconomic status (SES) in our society" (page 724). Not surprisingly, socio-economic status also matters when it comes to experiencing pain, with those of lower status experiencing more pain and feeling more disabled by pain (9,24,32). This relationship exists not just for objective status (e.g., education, wealth, education), but also for subjective socio-economic status (e.g., self-perceived social class) (30,34). For example, Brown-Iannuzzi (4) shows that subjective low socio-economic status leads to an increase in pain and pain symptoms; this effect occurs because those of lower perceived status are hyper-vigilant to threat meaning they exhibit particular sensory sensitivity and greater readiness to respond to stimuli. Economic insecurity may also lead to a lack of control, which in turn produces physical pain (8).

This dynamic should extend across settings including when it comes to injuries experienced by college student-athletes (which is our focus). We thus expect as one's subjective social status (i.e., class) increases, the experience of pain should decrease, all else constant (hypothesis 1). One important extension in the athletic context is to consider the likelihood that the student-athlete reports the pain. Extant studies typically focus on the experience of pain, concern about pain, the intensity of pain, life disruption and suffering due to pain, and

the use of pain medications (2,4,8). In many domains, individuals have little incentive to knowingly misreport pain – such motivations do exist, however, for athletes. In sports, reporting pain flags a potential injury, which in turn can limit or end participation. Therefore, athletes may feel incentivized to conceal the extent of their pain or other injury-related symptoms. Under-reporting of concussions occurs with some frequency (21), for example, and reflects, as Meier et al. (23) state, “a desire to continue playing, with awareness that self-reporting symptoms will prolong return-to-play decisions…” (page 507).

How might socio-economic status affect pain reporting among college student-athletes in particular? Consider that students of lower socio-economic status face unique challenges in navigating most university environments. Jury et al. (18) explain that there are “psychological barriers that low-SES students face in higher education as a result of the foundational cultural practices that guide how universities function… Identity management is one of the toughest challenges low-SES students face when entering the cultural context of higher education…. [There is] the feeling of being disconnected…” (emphasis in original; pages 25-26). It can become difficult for lower class students to maintain their class identity (26). This is likely a particularly prevalent challenge for student-athletes since a relatively large percentage of student-athletes live at levels below the poverty line (15). In such cases, the transition to college may be facilitated by a student athlete’s identity as a student-athlete: most view their identity as athletes as equally salient as or more salient than their identity as students (3,6,25,27). Student-athletes with lower socio-economic status will thus perceive their identities as athletes as particularly important and take steps to protect that identity even if it includes misreporting injuries that can limit or end participation.

Beyond identity management, individuals from lower classes typically experience more hardship, which can increase a perceived ability to withstand pain (11,14,33). They believe they can tolerate pain and thus report it less. Social pressures also can affect pain reporting – that is, as Kroshus et al. (21) explain, “the pressure that athletes experience from individuals in their sport environment to continue playing with symptoms…” (page 67). Pressure comes from multiple sources including one’s coaches or one’s family and friends. Low-status student-athletes may feel particular pressure to not disappoint family and friends who have supported them to enter what is often a new cultural and social world with unique opportunities (18). In short, psychological (identity), experiential (hardship/tolerance), and social (pressure) factors lead us to predict that student-athletes with lower socio-economic status will be less likely to report pain, all else constant (hypothesis 2). In other words, the very people who experience more pain may ironically be less likely to report it.

METHOD

We tested our hypotheses with a survey in which we solicited participation from NCAA Big Ten Athletic Conference student-athletes (i.e., our population is Big Ten student-athletes). We e-mailed invitations to current student-athletes on March 30th, 2016, asking them to take part in a survey on college athletics. A total of 1,615 student-athletes completed (at least a portion of) the survey. Survey implementation details and an explanation for our approach

are available in an appendix on the first author's website: http://faculty.wcas.northwestern.edu/~jnd260/. To gauge pain reporting, we offered each respondent the following vignette (11,13). The exact text read: We are next going to ask you to imagine a hypothetical scenario and then we will ask you some questions about it. Do your best to imagine this actually occurred.

Imagine that you sustained an injury at the start of your team's season. There is not a strict protocol for how long it will take to return to play. Your team's medical personnel expect you to make a full recovery; however, they predict you will miss practice and competition for at least 4 and up to 8 weeks.

Three sets of outcome variables followed this vignette. First, we asked two questions about pain experience: how painful respondents thought the initial injury would be and how painful the recovery process would be (both on 4-point scales, ranging from "not painful" to "extremely painful"). We recognize that this measure concerns the anticipation of pain rather than the actual ongoing experience of pain; however, we suspect it maps onto actual experiences insofar as most student-athletes likely have had some type of injury in the past and thus will imagine pain similar to what they previously experienced. The measures are akin to those used to capture perceptions of others' pain (33), but in this case, instead of others, it is a self-assessment.

Second, we asked two items that explicitly address pain reporting: would the respondents report the pain to medical personal (yes/no), and in reporting pain, would the respondents under-report, accurately report, or over-report the pain (on a five-point scale, ranging from "under-report a lot" to "over-report a lot"). Third, we sought to provide some insight into the proposed mechanisms. For identity, we asked respondents how unimportant or important their performance as a college athlete would be to their success after college (on a four-point scale, ranging from "very unimportant" to "very important"), how much desire they would have to return to play after an injury (on a five point scale, ranging from "no desire at all" to "a great desire"), and how much anxiety they would have from the injury and recovery process (on a five-point scale, ranging from "none at all" to "a great deal"). To measure hardship, we asked respondents how hard their lives have been (on a four-point scale, ranging from "not at all" to "extremely"); additionally, we asked about their expected tolerance for pain resulting from the injury in the vignette (on a four point scale, ranging from "very low tolerance" to "very high tolerance"). We further asked respondents how disappointed they thought their coaches, parents, and family and friends would be if they did not return quickly from the injury (on five point scales, ranging from "not disappointed at all" to "extremely disappointed") (21).

We measured respondents' self-perceived socio-economic status by asking whether they would describe themselves as being in the lower class, working class, middle class, upper middle class, or upper class; we coded this on a 5 point scale from lower to upper class (11). In focusing on self-perceived socio-economic status, as opposed to objective status, we follow the aforementioned work of Brown-Iannuzzi (4) who argues subjective class is the

more relevant construct when it comes to pain perceptions. We also asked respondents whether they had a partial or full athletic scholarship (coded 0 for no and 1 for yes). We suspect those on athletic scholarship will be less likely to report pain; as with student-athletes from lower socio-economic backgrounds, pain from an injury could hamper the scholarship-supported athletes' careers, which are presumably central to their identities (relative to those not on scholarship).

We additionally asked about each respondent's familial income, ethnicity, gender, year in school, in what sport(s) the respondent competes, highest level of education attained by one's parents, and the university the respondent attends. The inclusion of income allows us to ascertain whether subjective class is indeed a more salient factor than objective status. Prior work suggests that Black respondents may experience more pain (2) but be less likely to report it (33,35), and that women respondents are more willing to report pain (35). We suspect year in school to matter insofar as one may be more willing to report pain later in one's career.

Finally, we control for sport played, because sports for which injuries are more common may affect pain experiences and reporting behaviors. We sorted each sport into a low injury or high injury category, based on whether the number of reported injuries is below or above the mean score for NCAA sports. We did this by relying on the NCAA's Injury Surveillance Program (19) and, for the few sports not included in that program, on our impressions of likely injury rates. This led us to label the following as high injury sports: basketball, field hockey, football, gymnastics, ice hockey, lacrosse, soccer, volleyball, water polo, and wrestling. All survey question wordings are available in an appendix on the first author's website.

Statistical Analysis

In the following analyses, we examine three sets of dependent variables. The first set consists of initial injury pain, recovery pain, whether or not the respondent would report his or her pain, and the amount of pain the respondent would report. The second set includes the importance of sport to the respondent's post-collegiate success, the respondent's desire to return from an injury, and the anxiety a respondent would expect to have from the injury and recovery process. The final set are measures of life hardship, pain tolerance, perceived pressure from coaches to return to play, and perceived pressure from family to return to play.

We regress each of these outcomes on a series of predictors. These include socio-economic class, athletic scholarship status, gender, race (specifically if the respondent is Black), year in school, income, and whether the respondent plays a high injury sport. All regression models are ordered probits, with the exception of the model predicting whether the respondent would report any pain at all, which is a probit model. In addition to these regressions, we offer a selection of predicted probabilities for our dependent variables, conditional on specific values of the independent variables. For all predicted probabilities, we use the Clarify package for Stata (20).

One last note is that we expect pain reports to depend, in part, on gender and sport. As is

true with virtually any survey, our sample does not perfectly represent the population on these important factors. Thus, for all data descriptions and analyses, we weight the data based on gender, sport, and university. We specifically use inverse probability weighting (31). This method facilitates generalization to the population of Big Ten student-athletes (see the appendix on the first author's website for weighted sample comparisons with the population).

RESULTS AND DISCUSSION

Our sample is 45% female and 9% Black. Fifty-three percent are on at least a partial athletic scholarship, just over 50% come from sports we categorized as "high injury," and 47% are beyond their sophomore year of college. When it comes to income and class, the average respondent reports, respectively, a 3.67 on a scale where a 3 = $70,000 – $99,000, and a 3.53 on a scale where 3 = middle class. The break-down for class is 2% lower class, 9% working class, 33.5% middle class, 46.5% upper middle class, and 9% upper class. (The correlation between class and income in our data is .66; $p \leq .01$; there are no large correlations between class and sport, or class and school.)

The small percentages of lower and working class student-athletes mean they may stand out and consequently be particularly vulnerable to the aforementioned identity and social pressures. Even middle class student-athletes have large enough peer groups to vitiate these dynamics. This coheres with the reality of vast underrepresentation of lower and working class individuals in college settings (10,22): Williams (37) states, "the central divide between the working class and the middle class now is college" (page 1). Along these lines, we find a stark divide in our data when it comes to the highest level of education by one's parents. For lower and working class respondents, the respective percentages of parental college graduates are 48% and 59% whereas the percentages for middle, upper middle, and upper are 84%, 94%, and 94%. This suggests lower class and working class individuals are substantially more likely to be entering a new cultural domain.

When it comes to reporting pain, nearly 82% of respondents state that they would report the pain; however, the average respondent score for how much they would report is 2.32 (std. dev. = .75), where 2 = "under-report a little" and 3 = "accurately report." Only one respondent reported that he/she would "over-report a lot." Thus, student-athletes tend to be open to reporting their pain but also tend to under-report it. The impact of class is notable – those from the lower and working classes have a 70% chance of reporting pain, while those from the middle, upper middle, and upper classes have an 84% chance of doing so ($z = 4.08$, $p \leq .01$). The respective mean scores for the accuracy of reporting are: 2.13 (.90; 128), and 2.34 (.72; 1,258) ($t1384 = 3.06$, $p \leq .01$).

These figures offer preliminary evidence that class matters for pain reporting. We next present regressions of each outcome variable on the aforementioned explanatory variables. In Table 1, we present the results for experiencing pain and reporting. The first column shows that, consistent with hypothesis 1, as one moves from lower to upper class, he or she expects to experience less initial pain. Put another way, lower socioeconomic status leads to the expectation of greater pain from an injury. Holding all other variables at their mean levels,

a working class student-athlete has a 93% chance of feeling moderate or extreme pain compared to an upper middle class student-athlete whose chance is 88% – a small but significant effect. The second column of Table 1 shows that the class relationship does not hold for expected recovery pain. This may reflect a canceling dynamic such that lower status individuals anticipate more pain per se, but also believe they will be able to withstand the pain through the recovery process. The differential results on initial and recovery pain accentuates the importance of distinguishing between types of pain (11). We also find that female student-athletes display significantly greater expectation of both initial and recovery pain.

Table 1: Pain Experience and Pain Reporting

	(1) Initial Pain	(2) Recovery Pain	(3) Reporting Pain	(4) Amount of Pain Reported
Class	-0.125**	0.074	0.181**	0.159**
	(0.060)	(0.060)	(0.084)	(0.065)
Athletic Scholarship	0.025	0.095	-0.377***	-0.240***
	(0.076)	(0.075)	(0.104)	(0.075)
Female	0.275***	0.236***	-0.038	-0.039
	(0.074)	(0.072)	(0.101)	(0.071)
Black	0.059	0.191	-0.021	-0.093
	(0.143)	(0.127)	(0.192)	(0.143)
Year in School	0.030	0.016	0.035	-0.003
	(0.031)	(0.031)	(0.043)	(0.030)
Income	0.049	-0.005	-0.004	-0.066
	(0.041)	(0.043)	(0.060)	(0.045)
High Injury Sport	-0.071	-0.119	-0.107	-0.051
	(0.075)	(0.076)	(0.099)	(0.073)
Cut Point 1	-2.792***	-1.460***	–	-1.120***
	(0.274)	(0.217)		(0.216)
Cut Point 2	-1.326***	0.119	–	0.458**
	(0.224)	(0.191)		(0.209)
Cut Point 3	0.328	1.903***	–	1.723***
	(0.211)	(0.195)		(0.214)
Constant			0.520*	
			(0.270)	
Observations	1,363	1,362	1,361	1,336

All models are ordered probits, except model 3 which is a probit. Standard errors in parentheses;
*** p<0.01, ** p<0.05, * p<0.1 for two-tailed tests.

The next two columns provide strong support for hypothesis 2 – as class goes up, reporting does too. Or, in other words, student-athletes with lower socio-economic status are significantly less likely to report pain from an injury and, when they do report it, they are more likely to under-report. We also find that those on athletic scholarship are significantly less likely to report pain and more likely to under-report the extent of the pain. To get a sense of the substantive impact of class, consider that, holding all other variables at their mean levels, a lower class student-athlete has a 75% chance of reporting pain and an 72% chance of

under-reporting pain (either a little or a lot). The respective percentages for an upper middle class student-athlete are 85% and 60%. Thus, the shifts are quite substantial – much greater than the effects on the experience of pain.

We earlier speculated that the effects may not be monotonic but rather could stem from a divide between lower/working class student-athletes and middle/upper middle/upper class student-athletes. In the appendix available on the first author's website, we provide suggestive evidence along these lines. Specifically, we re-run the pain reporting models (which are presented in last two columns of Table 1) but differentiate the impact of each class rather than treating it as a single continuous variable. We find that, for the amount of pain, the lower and working classes significantly differ from the other classes, which do not differ among themselves. For reporting pain, the results are more ambiguous with working class and middle class student-athletes differentiating from higher class individuals. Clearly, more work is needed to isolate particular class differences – other work on socio-economic and health suggests a gradient such that the effects cover the full range of status and are not concentrated among only those with few resources (1). This dynamic may differ, however, in the domain of college athletics: lower and working class student-athletes enter an unfamiliar world when starting college, and their identity as student-athletes may facilitate adaptation.

Table 2: Sport Identity

	(1) Sport Importance	(2) Desire	(3) Anxiety
Class	-0.123**	-0.127*	-0.187***
	(0.059)	(0.068)	(0.066)
Athletic Scholarship	0.249***	0.211***	0.225***
	(0.073)	(0.081)	(0.082)
Female	-0.092	-0.004	0.269***
	(0.070)	(0.075)	(0.078)
Black	0.354**	-0.098	0.083
	(0.155)	(0.198)	(0.203)
Year in School	-0.105***	0.036	0.021
	(0.029)	(0.032)	(0.034)
Income	-0.052	0.034	-0.090*
	(0.043)	(0.048)	(0.049)
High Injury Sport	0.115	-0.040	-0.216***
	(0.073)	(0.079)	(0.081)
Cut Point 1	-1.972***	-2.551***	-2.992***
	(0.196)	(0.258)	(0.259)
Cut Point 2	-1.190***	-1.961***	-1.794***
	(0.195)	(0.215)	(0.223)
Cut Point 3	0.047	-1.283***	-1.026***
	(0.194)	(0.226)	(0.222)
Cut Point 4	–	-0.368*	–
		(0.220)	
Observations	1,372	1,364	1,363

All models are ordered probits. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1 for two-tailed tests.

Table 3: Life Experience, Pain Tolerance, and Expectations

	(1) Hardship	(2) Pain Tolerance	(3) Coaches Expect	(4) Family Expect
Class	-0.326***	-0.140*	-0.025	-0.173**
	(0.066)	(0.073)	(0.067)	(0.073)
Athletic Scholarship	0.067	0.146*	0.189**	0.125*
	(0.076)	(0.078)	(0.075)	(0.073)
Female	-0.147**	0.016	0.016	0.169**
	(0.071)	(0.074)	(0.070)	(0.069)
Black	0.163	0.411**	0.256	-0.079
	(0.142)	(0.198)	(0.175)	(0.173)
Year in School	-0.021	0.078**	0.071**	-0.038
	(0.032)	(0.034)	(0.030)	(0.030)
Income	-0.031	-0.003	-0.046	0.004
	(0.047)	(0.048)	(0.048)	(0.049)
High Injury Sport	0.067	0.107	-0.125*	-0.111
	(0.074)	(0.076)	(0.072)	(0.072)
Cut Point 1	-2.197***	-2.660***	-1.717***	-1.423***
	(0.208)	(0.280)	(0.207)	(0.206)
Cut Point 2	-1.025***	-1.314***	-1.010***	-0.744***
	(0.202)	(0.220)	(0.207)	(0.205)
Cut Point 3	0.619***	0.382*	-0.057	-0.144
	(0.197)	(0.216)	(0.202)	(0.205)
Cut Point 4	–	–	0.680***	0.542***
			(0.201)	(0.207)
Observations	1,373	1,361	1,357	1,362

All models are ordered probits. Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1 for two-tailed tests.

We suggested three dynamics drive this behavior: the salience of athletic identity, having experienced a harder life and having more pain tolerance, and social pressure. We present results for each of these outcome variables in Tables 2 and 3. We find evidence consistent with all explanations. Lower (higher) socio-economic status leads to significant increases (decreases) in the importance of one's sport, the desire to return to play, and anxiety due to the injury. Class additionally (negatively) correlates with perceptions of having a harder life and being tolerant of pain; moreover, those from lower classes are significantly more likely to believe that their family and friends will be disappointed should they be unable to play due to an injury. They do not, however, feel added pressure from coaches. We further find that scholarship athletes display the same dynamics when it comes to identity – sports are significantly more important and they have greater desire and anxiety, than non-scholarship athletes. However, they do not report lower pain tolerance than non-scholarship athletes, and fear disappointment not only from family and friends but also from coaches. The other significant variables, while sensible, do not display a consistent pattern across models, and thus, we are cautious in drawing any additional conclusions.

In sum, subjective socio-economic status has notable effects when it comes to student-athlete injuries. Lower and working class student-athletes are more likely to anticipate feeling initial pain but less likely to report it accurately. This behavior likely reflects unique

psychological (i.e., identity), experiential (i.e., hardship/pain tolerance), and social (i.e., pressure) dynamics present in the lives of lower status student-athletes. Our data do not allow us to test for causal mediation (5). However, in the appendix available on the first author's website, we offer suggestive evidence that it is anxiety and family expectations that lead lower status individuals to not want to report pain at all, while it is pain tolerance that drives under-reporting. Thus, there may be distinct pathways at work on these separate variables.

CONCLUSION

College is often viewed as a path to upward mobility. Yet, for those of lower socio-economic status, it can be a challenge (17). These hurdles can manifest in a variety of ways including academic performance, socialization, and health. We find that among college student-athletes, lower class individuals tend to under-report injury pain – even though they anticipate experiencing more pain from an injury. The irony, of course, is that "playing through the pain" appears to be more of mantra for those most vulnerable from a general health perspective. Lower class individuals strive to adapt to their own detriment (36). This is the first documentation, of which we know, that shows the double-edged situation for those who perceive themselves to be lower class. It highlights the need to study the role of socio-economic class in athletic injuries and healing. Indeed, we view our study as the first in what we hope will be a line of inquiry that explores pain reporting among student-athletes.

APPLICATIONS IN SPORT

The applied lessons of our study are clear. Self-reports of injury and pain are widely used in college athletics (29). Thus, understanding what leads one to under-report is critical. Practitioners who anticipate under-reporting among certain populations, such as low socio-economic individuals, can monitor carefully and probe deeper when injuries do occur. We find it is self-perceived class rather than objective standing (i.e., income) that matters. This conclusion coheres with some prior work (4) and means that practitioners can intervene by altering student-athletes' perceptions of their standing. Perhaps more importantly, though, is that practitioners should be particularly attentive to student-athletes who might consider themselves lower class, and take extra precautions to ensure they receive needed treatments. That said, such interventions require a deeper understanding of mechanisms – we presented suggestive evidence of psychological, experiential, and social mediators – but much more work is needed to understand how to create a salubrious college environment that facilitates upward mobility. In the meantime, practitioners should consider the various pathways to under-reporting.

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