Intelligence Stereotypes of Student-Athletes at Northwestern University

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Abstract

Implicit and explicit intelligence stereotypes of student-athletes at an elite academic and athletic institution, Northwestern University (NU), are measured. Fifty-two currently enrolled NU undergraduate students completed an online survey; eighteen of these participants were members of one of the university's 19 NCAA Division I teams at the time of the study. The first section of the survey was an Implicit Association Test (IAT) to explore if participants hold implicit biases when the apparel of student-athletes versus non-athletes is designed to be the most salient feature of the stimuli being categorized. The IAT results suggest that NU student-athletes implicitly hold positive views of themselves in regards to intelligence. To measure explicit biases, participants estimated the average high school GPA, ACT score, and college GPA of NU student-athletes versus non-athletes, which resulted in a main effect of athlete status of the group being estimated for each measure. Participants provided consistently lower estimations of the academic merit of NU student-athletes, and there is partial support that student-athletes themselves exhibit this bias more strongly. For ACT estimations, there was a significant interaction between athlete status of the group being estimated and athlete status of the estimator; student-athletes estimated themselves to have lower ACT scores than non-athletes thought they did and also estimated non-athletes to have higher ACT scores than that group estimated of themselves. The inconsistency of the implicit and explicit bias measures suggests that the relationship between athletic and academic identity is complex and may involve pluralistic ignorance.

Keywords: student-athlete, implicit bias, intelligence stereotypes

Intelligence Stereotypes of Student-Athletes at Northwestern University

Student-athletes at Northwestern University (NU) are in a unique situation granted both the academic rigor of the university—ranked number ten in the world (U.S. News & World Report, 2018)—and its status as a member of the competitive Big 10 athletic conference. Despite the university's history of withholding average acceptance criteria or average GPA of enrolled students from public view[1], do undergraduates generate and hold intelligence stereotypes of student-athletes at NU? Understanding the prevalence of student-athlete intelligence stereotypes at NU is important due to the implications such stereotypes could have on academic achievement.

Literature Review and Hypotheses

Student-athletes across the nation, in general, achieve less in the classroom than their non-athlete peers, although there are many more intricacies to this statement when considering other factors (level of recruitment, gender, etc.) that influence academic outcomes (Bowen & Levin, 2003). However, it is unclear if this is due to innate cognitive abilities, circumstances such as time demands, or even psychological factors such as stereotype threat and the self-fulfilling prophecy; much of the research on student-athletes has attempted to identify these predictive factors (e.g., Comeaux & Harrison, 2011). Perhaps of greater concern than underachievement is relative underperformance. Academic underperformance constitutes performing worse than peers who are near matches in terms of characteristics such as gender, race, socioeconomic background, and SAT scores. In the case of underperforming student-athletes, this means performing worse than peers who are highly similar, with the

exception of athlete status. Bowen & Levin (2003) report this as an alarming trend within intercollegiate athletics and—with additional relevance to NU as a prestigious academic institution—especially amongst student-athletes recruited to attend Ivy League schools and New England Small College Athletic Conference schools.

Many studies have identified the student-athlete label as something that can evoke stereotype threat, which could be a contributor to academic underperformance of this group (Stone, Harrison, & Mottley, 2012; Dee, 2014; Yopyk & Prentice, 2005; others). A study that measured many aspects of the student-athlete experience specifically at highly-selective colleges found that being labeled as a student-athlete impeded with academic achievements increasingly so over the course of four years, including earning respect from professors (Aries, McCarthy, Salovey, & Banaji, 2004). For a deeper understanding of the presence or absence of the student-athlete intelligence stereotype at NU, it is important to consider what generates the student-athlete label on campus.

One factor of interest in the current study is the apparel or gear that NU student-athletes receive annually; this apparel is often worn not only to team-related functions, but also to class and as day-to-day clothing. The student-run magazine, North by Northwestern, recently published an article titled, “Tackling the hyphen: student-athletes struggle to balance top-tier expectations in the classroom and Big Ten pressures in competition” (Mendoza, 2018). Throughout this article, the influence of wearing athletic apparel is mentioned several times by various student-athlete interviewees. As an example, a member of the women’s swim team stated:

> I try to wear regular clothes for the week because the non-athletes tend to not like athletes in the classes I'm in. I first like to establish myself as someone who is equal to everyone else in knowledge and ability and commitment before I tell people that I'm an athlete. (p. 53)

The presence of stereotype threat implies existence of a stereotype and qualitative evidence of the importance of apparel in avoiding assumptions about one's intelligence offers a suggestion for what could elicit stereotype threat, leading to the first hypothesis: participants will demonstrate negative implicit biases regarding the intelligence of student-athletes, which is evoked by the athletic apparel that student-athletes often wear (H1).

In the most recently published iteration of the NCAA's Growth, Opportunities, Aspirations and Learning of Students in college (GOALs) study of about 20,000 student-athletes, a majority of Division I varsity student-athletes—60% of males and 76% of females—reported a high academic identity (NCAA, 2013). For females, this percentage actually surpasses the 75% of women who identify as having a strong athletic identity, whereas for men, 80% posses a high athletic identity. These data point to gender differences in the student-athlete identity, as supported by previous literature (Sturm, Feltz, & Todd, 2011). However, other research also suggests that these gender differences may be becoming less prevalent (Shulman & Bowen, 2001; Aries et al., 2004). Regardless of gender, the NCAA GOALs study suggests that student-athletes view academics as an important part of their identity. Yet, Aries et al. (2004) found that at highly-selective colleges, student-athletes' self-assessments of themselves rank their intellectual abilities lower than how their non-athlete peers rank themselves. These studies did not compare in-group and out-group rankings, but another study did find that both

student-athletes and non-athletes hold negative intelligence stereotypes against student-athletes (Wininger & White, 2015). However, within the student-athlete group, student-athletes estimated academic achievement to be lower the further away from the self the person being estimated was (self as closest, student-athlete on a different team as furthest). Thus, hypothesis two states: estimated intelligence will be greater for NU students than it is for NU student-athletes (H2). And hypothesis three states: although both student-athletes and non-athletes will estimate the intelligence of student-athletes to be significantly lower than non-athletes, the student-athlete group's estimate of themselves will be significantly lower than the non-athlete group's estimation of that group (H3).

Methods

Participants

Fifty-two NU students completed an online Qualtrics survey. Thirty-two others started the survey but backed out at some point in time; these data were deleted. Participants were recruited by the research team who distributed the survey link to their social network. Participants completed the survey on a voluntary basis; no compensation was granted. Eighteen of the participants indicated that they are currently a varsity student-athlete on one of NU's 19 Division I NCAA teams. The other 34 participants indicated that they do not participate in a varsity Division I sport and form a second category of students who, in contrast to student-athletes, will be referred to as "non-athletes". The median age of all participants was 20 (SD = 1.07), with a median graduation year of 2020, which equates to junior status. Although additional options were presented, all participants indicated either "male" or "female" as their gender identity; 84.62% of the participants were female and the other 15.38% were male.

46.15% of participants selected White as their ethnicity, 38.46% were Asian, 7.69% were of Hispanic, Latinx, or Spanish origin, 5.77% were of some other race, ethnicity, or origin, and 1.92% were Black or African American.

Materials

A landing page listed information about the requirements to participate in the study. The two requirements were that the participant must be an undergraduate student at NU and have access to a laptop computer or other device that has a keyboard.

IAT materials. The first main section of the survey consisted of a Implicit Association Test (IAT) that a member of the research team generated for this study. The overall format of the IAT was consistent with that of how IATs have historically been used in psychological research (Greenwald, McGhee, & Jordan, 1998). The IAT was integrated into a Qualtrics survey using a web interface that can be found at https://applibs.shinyapps.io/iatui2/ (Carpenter et al., 2018B). This method has been validated as a reliable way to run IATs (Carpenter et al., 2018A) and there is evidence that IATs can reliably measure the relationship between aesthetic features and the innate quality of something (Maison, Bruin, & Greenwald, 2001).

Before taking the IAT, participants viewed a table that included the 20 total items they would be encountering in the IAT. In this visual, there were four categories of five items each, as shown in Figure 1. In the *student-athlete apparel* and *student apparel* categories, items were matched by item type in order to retain consistency. For example, since an athletic sweatshirt (distributed to all student-athletes during the year the data were collected) was included in the *student-athlete apparel* category, a non-athletic sweatshirt was included in the *student apparel* category. In addition to item type, measures were taken to keep characteristics of the items

consistent. For example, for each *student-athlete apparel* item that has a Northwestern logo on it, the equivalent *studen*t *apparel* item also has a similar Northwestern logo. When choosing the images, consistency with color of the items was also taken into account. We considered two criteria to distinguish an athletic item from a non-athletic item. First, an item was considered an athletic item if it is embellished with an Under Armour logo (the official athletic sponsor of NU) or if it is an item that was distributed to all student-athletes in the present year (e.g., Gatorade water bottle).

For the word categories, five words representative of *smart* and *stupid* were selected for each category. Similar to how the apparel image categories were structured, the words in the *smart* category are associated with a related, but opposite word in the *stupid* category and vice versa.

The IAT consisted of five blocks. A block includes a series of stimuli that are sorted into one of two categories. In three of the blocks, single associations were made, such as the apparel images with the *student-athlete apparel* or *student apparel* categories. In the other two blocks, double associations were made, where apparel images and words were presented to be sorted into, for example, a *student apparel or smart* category versus a *student-athlete apparel or stupid* category. Figure 2 provides an example screen from each block of the IAT. The first block always presented the apparel images to be sorted into either the *student-athlete apparel* category or the *student apparel* category, with the intention of helping participants to further learn which images belong to which category, beyond what they already knew from viewing the categories presented in the image shown in Figure 1. The next block served a similar purpose for the *smart* and *stupid* categories, however, the relative position of these two categories was counterbalanced

across participants because the order determined which double association would be presented in the subsequent block. For example, if *smart* was presented on the left in the second block, then a participant would first be forming an association with *student-athlete apparel* and *smart*, but because of the counterbalancing, about half of the participants were presented the blocks in such a way that they would first form an association with *student-athlete apparel* and *stupid*. After this third block, the word categories switched positions and once these new relative positions were relearned in a single association block, a final double association block was completed with the two categories swapping their pairings from the first double association block.

Explicit bias materials. The second section of the survey was a series of 14 multiple choice and text-entry questions. The first three were demographic questions to collect data about participants' age, gender, and race. The next three questions gathered information specific to the participant's status at NU University. A question was first asked to verify that the participant was, in fact, currently enrolled as an undergraduate student at NU University. Then, participants were asked to indicate their graduation year and to what extent they are involved in athletics at Northwestern (*varsity sport, intramural sport, club sport,* or *no athletic involvement*). The latter three categories were collapsed into a single "non-athlete" category. Next, participants estimated the average high school GPA, college GPA, and ACT score of student-athletes and non-athletes separately. These six questions were presented in a random order and can be found in the appendix. Lastly, participants were instructed to use a dropdown to indicate, in order, the top three schools within NU with the highest undergraduate populations. The drop down included all six NU undergraduate schools and colleges. Participants then repeated this process for the last question except with regard to the student-athlete population specifically.

Procedures

Participants navigated through the survey in the order presented in the materials section. Participants had the option to back out of the survey at any point by exiting the browser window. For the IAT section of the survey, participants used the *e* and *i* keys on their laptop or computer keyboard to sort the stimuli into the appropriate categories. If an image was sorted into the incorrect category, a red *X* appeared, alerting participants that they made an error, which they had to correct before moving on to the next stimulus. After completing the IAT, participants proceeded to complete the multiple choice and text-entry questions of the survey. If participants attempted to navigate past a question without having provided an answer, they were prompted to selected or list an answer before moving on. After submitting answers to all questions, participants were brought to a page thanking them for taking the survey. The Qualtrics survey was the only task that participants completed for the current study.

Results

IAT results

IAT results were analyzed both with and without regard to athlete status. The first row of Table 1 shows the IAT results when group status was not taken into account, the second and third rows list the results when student-athletes' and non-athlete's IAT scores were analyzed separately. The only significant IAT results were the IAT scores of student-athletes. The mean D-score (*M*) was -0.25, $p < 0.05$, and $d = -0.51$, demonstrating a medium effect size, meaning that student-athletes exhibited a moderate preference for the association between *student-athlete apparel* images and the *smart* category.

Explicit bias results

One participant's data for this section was excluded because an invalid GPA estimate was submitted (> 4.0). Three 2x2 ANOVAs were performed to seek information on main effects of athlete status of the estimator and athlete status of the group being estimated, as well as interactions between the two factors. The three ANOVAs were performed on the estimated high school GPA, estimated ACT score, and estimated NU GPA data. The means and standard deviations of these data are shown in Table 2. The z-score means of student-athlete and non-athlete intelligence were -0.41 (SD = 1.00) and 0.42 (SD = 0.81), respectively.

As shown in Table 3, there was a main effect of the group being estimated across all three measures of intelligence. For each measure, NU student-athletes were predicted to have significantly lower marks in comparison to their non-athlete peers. When the three measures of intelligence were collapsed into one variable, there was a main effect of athlete status of group being estimated with a large effect size; $F(1,49) = 64.431$, $p < 0.001$, $\eta 2 = 0.30$. The only significant interaction across all three measures of intelligence was found in the estimated ACT score data, $F(1,49) = 5.16$, $p < 0.05$ and a small effect size with $\eta 2 = 0.03$ (see Figure 3).

Discussion

The IAT and the explicit bias questions captured different information about the intelligence stereotype. Opposite to what the ACT data show, student-athletes demonstrated a bias towards associating student-athletes with the *smart* category. Although in a way opposite of expected, these data provide evidence that these student-athlete apparel items do possess some type of innate meaning to the student-athletes who view them. The non-athletes demonstrated no significant IAT results. H1 was not supported, as student-athletes were not associated with *stupid* either overall or when group status was taken into account. These results are surprising

considering the evidence on stereotype threat of this group and the idea that student-athlete apparel is a medium for making the student-athlete label salient. However surprising, these results are promising because they suggest that NU student-athletes hold a positive view of their intelligence.

H2 was supported across all categories and groups. Non-athletes were estimated to have higher high school and college GPAs as well as ACT scores than student-athletes. These data point to existence of an intelligence stereotype towards NU student-athletes, especially considering the complete absence of published data distinguishing the academic success of student-athletes versus non-athletes at NU.

The interaction of athlete status of estimator and athlete status of group being estimated for ACT scores suggests that student-athletes explicitly hold a more negative self view of their intelligence than their non-athlete peers have of them while also overestimating their non-athlete peers' ACT scores relative to that group's self-assessment. An alternative explanation is that both groups underestimate their ACT scores relative to the out group's estimation. This interaction, and the absence of interactions with the GPA data, could be the result of many possible reasons. It is possible that ACT scores are a better representation of perceived intelligence in comparison to both high school and college GPA. This hypothesis could be argued on the basis of the other factors that contribute to one's GPA, such as choice of major and access to tutoring services. The alternative hypothesis could also be supported by evidence about factors contributing to ACT scores such as number of times taking the test, time spent studying, and access to test preparation materials. Based on these results, future work should explore these same questions but with various other measures of intelligence to see if these results can be

replicated. When the data were converted to z-scores and collapsed into a single variable of intelligence, the interaction was not significant, $F(1,49) = 3.66$ and $p = 0.06$. Thus, H3 was partially supported. Student-athletes did not estimate their intelligence to be lower than the non-athletes estimated student-athletes' intelligence to be across all measures of intelligence; when considering only ACT score estimations, the hypothesis was supported.

The conflicting implicit and explicit bias results could be explained by White's (2010) findings that student-athletes apply the intelligence stereotype to other student-athletes, but not to themselves. It is possible that, through owning several or all of the items in the *student-athlete apparel* category of the IAT, student-athletes framed the task to be more personally relevant in comparison to the average GPA and ACT estimation tasks. Higher regard for one's own academics in comparison to others within the same student-athlete group is also consistent with the GOALs study that reported a majority of student-athletes self-identifying highly with academics (NCAA, 2013). All of this evidence fits into the framework proposed by Levine, Etchison, & Oppenheimer (2014) who explained how pluralistic ignorance perpetuates the intelligence stereotype within the athletic community. Data from the current study and studies past indicate that, while the student-athlete intelligence stereotype is widespread, it is perhaps the strongest when a student-athlete is thinking about the student-athlete population as whole, minus themself.

Limitations

This study should be replicated with a larger sample size to increase power, as the ACT score interaction (power = 0.36) and the significant IAT result (power = 0.40) were underpowered. Despite the small sample size, the main effect of athlete status of group being

estimated was sufficiently powered (power = 0.91). Ideally, the sample sizes of the student-athlete and non-athlete groups would be equal. Measures should also be taken to increase the representation of all 19 varsity sports, as this study did not selectively sample an equal or representative sample of student-athletes from each sport.

Future Work

Although the results do demonstrate an intelligence stereotype against NU student-athletes, no data was collected to attempt to determine the root cause(s) of that stereotype. For example, it is possible that this stereotype is influenced by racial stereotypes, gender stereotypes, beliefs about student-athletes and the admissions process, beliefs about the rigor of majors student-athletes tend to pursue, or other reasons left unmentioned. Understanding potential causes of this stereotype would offer more practical next steps to resolving this issue.

Action Items

This study exposed that both student-athletes and students hold an explicit intelligence stereotype towards student-athletes at NU. Based on prior research, this stereotype could negatively impact the student-athletes' academic performance due to stereotype threat. In addition, this study provides some evidence that student-athletes' stereotypes towards themselves are stronger than non-athletes stereotypes towards them. Based on these findings, NU should consider devoting resources towards eliminating the student-athlete intelligence stereotype both within and outside of the athletic community. To reduce the probability that pluralistic ignorance persists, student-athletes should receive guidance on how to gain and maintain confidence in not only their own academic ability, but also the academic ability of their fellow student-athletes.

Honoring and showcasing student-athletes for their academic achievements could be the very thing that helps more student-athletes achieve academically.

Appendix

1. Please estimate the average cumulative **high school** GPA of Northwestern University **students** (on the 4.0 scale):
2. Please estimate the average cumulative **high school** GPA of Northwestern University **varsity student-athletes** (on the 4.0 scale):
3. Please estimate the average cumulative GPA of Northwestern University **students** (on the 4.0 scale):
4. Please estimate the average cumulative GPA of Northwestern University **varsity student-athletes** (on the 4.0 scale):
5. Please estimate the average ACT score of Northwestern University **students** (out of 36):
6. Please estimate the average ACT score of Northwestern University **varsity student-athletes** (out of 36):

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Footnotes

[1]NU's athletic department occasionally publishes average GPA data of student-athletes. For example, in 2018, nusports.com published an article celebrating the record-breaking 3.33 average GPA earned by student-athletes in 2017-2018 (NU Sports, 2018).

Table 1
IAT Results

	n	*scored*	*M*	*SD*	95% CI	*t*	*d*	*rel*	*err*	drop
overall	51	51	-0.01	0.48	[-0.15, 0.13]	-0.14	-0.02	0.84	0.09	0
student-athletes	18	18	-0.25	0.48	[-0.49, -0.01]	-2.18*	-0.51	0.90	0.11	0
non-athletes	33	33	0.12	0.44	[-0.04, 0.28]	1.56	0.27	0.86	0.09	0

Notes. Rel = estimated internal consistency of IAT. Err = rate of erroneous responses. Drop = responses dropped for > 10% of responses < 300 ms (Carpenter et al., 2018). * $p < .05$

Table 2

Descriptive statistics of intelligence estimations

	Student-athlete		Non-athlete	
	M	*SD*	*M*	*SD*
Estimated high school GPA of NU student-athletes	3.61	0.19	3.47	0.31
Estimated high school GPA of NU non-athletes	3.78	0.28	3.76	0.16
Estimated ACT score of NU student-athletes	29.33	1.97	30.82	2.27
Estimated ACT score of NU non-athletes	33.06	1.21	32.82	1.86
Estimated college GPA of NU student-athletes	3.20	0.22	3.27	0.31
Estimated college GPA of NU non-athletes	3.44	0.33	3.36	0.20

Table 3

Two-Way Analysis of Variance of Intelligence Estimations by Athlete Status of Estimator and Athlete Status of Group Being Estimated

	df	*SS*	*MS*	*F*	*p*
High School GPA Estimations					
Athlete status of estimator	1	0.24	0.24	3.88	0.05
Athlete status of group being estimated	1	1.55	1.55	24.73	***2.82e-06
Interaction	1	0.02	0.02	0.29	0.59
ACT score estimations					
Athlete status of estimator	1	9.3	9.26	2.46	0.12
Athlete status of group being estimated	1	169.3	169.26	44.98	***1.29e-09
Interaction	1	19.4	19.40	5.16	*0.03
College GPA estimations					
Athlete status of estimator	1	0.01	0.01	0.07	0.79
Athlete status of group being estimated	1	0.50	0.50	6.88	*0.01
Interaction	1	0.16	0.16	2.18	0.14

Note. * $p<0.05$, ***$p<0.001$

Student-athlete apparel					
Student apparel					
Smart	smart	competent	resourceful	efficient	bright
Stupid	stupid	incompetent	unresourceful	slow	dull

Figure 1: IAT categories and corresponding items

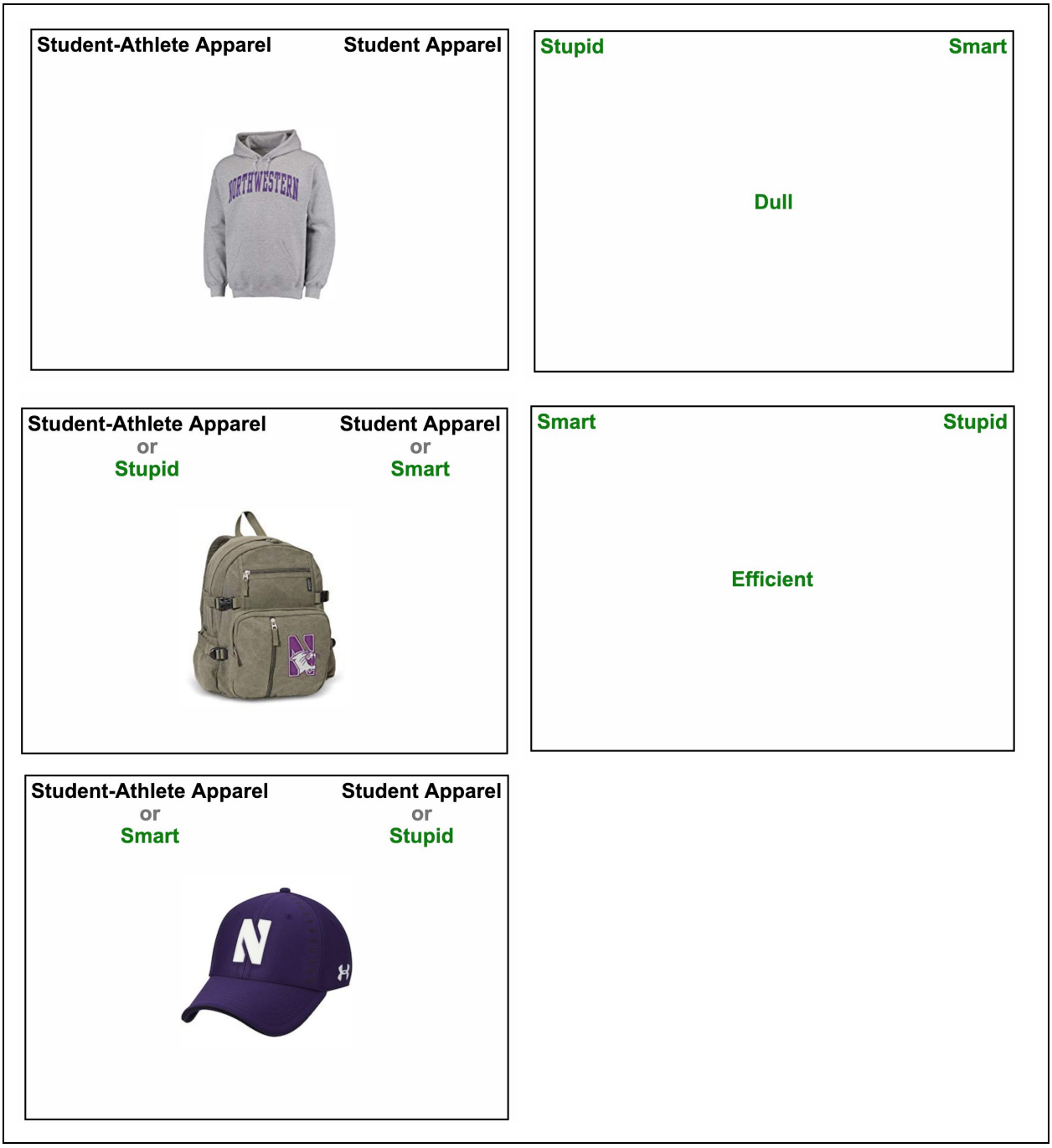

Figure 2: Examples of each IAT block, in order from left to right and top to bottom

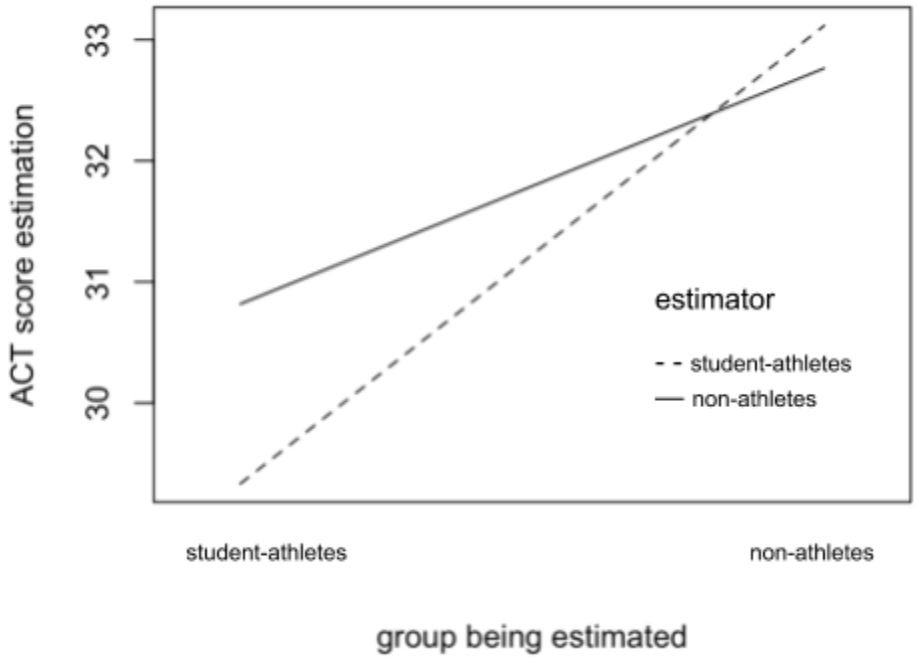

Figure 3: Estimated ACT Scores Interaction