Title: Examining how the presence, absence and numerical value of a grade affects students' perceptions of assessment feedback.

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- 5 Keywords: Feedback-perception; Higher Education; Students; Grade-perception, Grade-
- 6 priming.
- 7
- 8 This is a pre-publication version of the following article
- 9 Lancaster, G.L.J., Bayless, S.J., & Punia, R. (2020) Examining how the presence, absence and
- 10 numerical value of a grade affects students' perceptions of assessment
- 11 feedback. *Psychology Teaching Review, 26(2).*

Title: Examining how the presence, absence and numerical value of a grade affects students' perceptions of assessment feedback.

14

15 Abstract

16 We explored whether the academic grade a student sees influences how positively or negatively they interpret written assessment feedback. Specifically, an experimental design was used 17 18 where N = 94 psychology students each read an identical passage of neutrally worded feedback. Depending upon which of three experimental conditions they had been allocated to, they also 19 20 saw with the feedback either a grade of (i) 75% (High Grade; n = 33); (ii) 45% (Low Grade: n 21 = 31) or (iii) No Grade (control condition; n = 30). Next, they answered seven questions relating to their perceptions of the feedback they had read. As predicted, those in the High Grade and 22 23 No Grade conditions provided significantly more positive perceptions of the neutral feedback 24 compared to those in the Low Grade condition. Implications for those within higher education, 25 who are responsible for deciding how and when grades and feedback are released to students, 26 are discussed.

27

28 Introduction

29 Qualitative assessment feedback is a key component in learning gain (Hattie & Timperley, 30 2007), and recent years have seen considerable interest in improving feedback practices 31 across higher education (see e.g. Evans, 2013 for a review). Although a large proportion of 32 research related to feedback content and practices is carried out in the UK (perhaps in response to the NSS, Evans, 2013), the issue is also of relevance internationally (Carless 33 34 Salter, Yang & Lam 2011; Broadbent, Pandero & Boud 2018, Winstone & Nash, 2016), and 35 it is widely recognised that assessment feedback is key for effective student progress (e.g. Ilgen & Davis, 2000). In addition, students who act upon their feedback tend to have 36 37 better self-regulated learning and academic outcomes (Brown et al., 2016). However,

a remaining challenge is to determine how students perceive their feedback, and to what
extent they successfully engage with the feedback process (Winston et al., 2017). Student
satisfaction with feedback is a persistent cause for concern in higher education where a
pertinent example is the National Student Survey in which feedback satisfaction continues to
rate lower than other areas covered by the survey (Office for Students, 3rd July, 2019).

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44 Assessment feedback has the potential to be useful and constructive to learning if 45 appropriately acted upon, but this may depend on how it is delivered (Winstone et al., 2017) 46 and also how it is received and perceived by the student. Qualitative feedback verbally communicates to the student areas of strength in their work, areas in need of improvement 47 48 and suggestions for how the student might improve in their future work. This type of 49 feedback has the potential to elicit differing responses, reactions and perceptions in the 50 recipient. For example, Baadte and Schnotz (2013) have reported that feedback can affect 51 students' motivation and engagement. As a result, much research effort has been directed 52 toward identifying an optimal delivery method for feedback (Price et al., 2011; Winston et al., 2016). Fundamental to the effectiveness of feedback are the assumptions that students 53 54 will actively read; mentally process; and then act upon their feedback. However, low levels of 55 engagement with feedback (such as collecting/cursorily reading) are commonly reported (e.g. 56 Hounsell et al., 2007; Sinclair & Cleland, 2007). Price et al (2011), report that, for some 57 students, the grade alone is sufficient as a form of feedback, and that for some, a grade that 58 meets their current self-expectation will actually reduce their motivation to attend to, and 59 engage with, the written feedback.

60

Withholding assessment grades and releasing qualitative feedback first, has been investigated
as a potential tool to improve student engagement with feedback (Irwin et al., 2013; Jackson

63 & Marks, 2015; Lipnevich & Smith, 2009). However, to date, we found only one research report (Lipnevich & Smith, 2009) which has systematically addressed the impact 64 of the grade awarded has on the receiver's response to feedback. Lipnevich and Smith (2009) 65 66 used an authentic learning task to investigate the effects of feedback type, praise and grade on student performance. Lipnevich and Smith (2009) manipulated whether or not a grade was 67 68 presented, and whether the presence of a grade had an impact on the effectiveness of the feedback. Overall, detailed feedback had the most beneficial effect on improvement. 69 70 However, substantially lower improvement was observed when feedback had been coupled 71 with a grade than with no grade given. The authors suggest that students' responses to the grade may impact their perception and processing of the feedback. This is very likely given 72 73 the influence that emotions can have on cognitive processing (see Mueller, 2011 for review) 74 and in educational assessment in particular (see Boud & Falchikov, 2007). In addition, the findings from Lipnevich and Smith (2009) indicate that receiving a grade directly impacts the 75 student's response to their feedback, either due to a reallocation of cognitive resources, 76 77 and/or their affective reaction.

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79 Irwin et al. (2013) report a case study of adaptive grade release, which required students to 80 engage with the written feedback and submit a written reflection about the feedback before 81 their assignment grade was released. Withholding grades was associated with better 82 engagement with the feedback, for example being able to remember the feedback for longer, and better target setting for future assignments. Similarly, Jackson and Marks (2016) reported 83 84 an improvement in the quality of student work during a trial of withholding assessment marks 85 and requiring reflective commentary on the written feedback. However, the authors also reported that grade withholding could result in negative affect, in particular, feelings of 86 87 frustration and anxiety.

89 Although there has been some interest in grade withholding there is little direct and 90 systematic investigation of the possible priming effect of assessment grade on perception of 91 the associated feedback. This is an important focus for feedback research as there is a growing awareness and interest in how academic emotions influence learning (Pekrun, 92 93 2011). Pekrun (2011) has proposed the potential effects of both positive and negative 94 academic emotions on subsequent learning, motivation, attention and self-efficacy. For 95 example, feeling pride in response to assessment feedback has been shown to trigger 96 motivation for future learning in some cases and complacency, and a reduction in perceived effort, in others (see Kahu et al., 2015). More recently, Pitt and Norton (2017) examined 97 98 students' reactions to feedback for examples of "good" and "bad" pieces of work they had 99 completed. The authors highlighted that the student's response to their feedback was largely determined by their emotional maturity, and how the student perceived the work against their 100 101 own internal expectation of performance. Overall, most of the interviewees adopted 102 maladaptive strategies to feedback (avoidance, fear, annovance) that accompanied a "bad" 103 grade, indicative of low emotional maturity (despite being final year undergraduates). Underperformance triggered feelings of motivation to improve and learn from feedback in 104 105 only a few of the students, in line with Pekrun's (2011) theory of academic emotions. Howell et al. (2018) evaluated students' responses to learner analytics messages in a quasi-106 107 experimental study depending on the hypothetical grade (Distinction/pass/fail) that was sent 108 to them. As expected, higher grades were associated with more positive affect, and lowest 109 grades with most negative affect. Although the study did not explicitly address the effect of 110 such emotional reactions on perceptions of feedback, it would not be unreasonable to deduce that a very similar pattern would be observed. 111

113 The potential for grades exerting a negative priming effect on feedback perception is 114 arguably a problematic outcome, especially for students who receive a low grade and so have 115 an arguably greater need for improvement than those with a higher grade. Despite the 116 interest in best practice for delivering feedback, it is surprising that the potential priming effect of the assessment grade on feedback perception has not, thus far, been investigated. 117 118 Similar priming effects have been reported in research addressing evaluations of teaching where there is some evidence that the grade a student receives affects how they subsequently 119 120 rate the quality of the teaching they have experienced (Arnold, 2009; 121 Brockx, Spooren and Mortelmans, 2011) 122 123 The present study aims to use a controlled online experiment to explore whether 124 undergraduate students' evaluations of neutrally worded, written assessment feedback is affected by the presence and value of a grade. It is predicted that the perception ratings 125 126 students give for a piece of written feedback will differ significantly across three different

127 conditions; (i) where no grade is shown; (ii) where a low academic grade is shown and (iii)128 where a high academic grade is shown.

129

130 Method

131 Participants

The study was conducted online between January and March 2019 and initially, N=101undergraduate psychology students, in their first or second year of study from the University of Winchester participated. However, incomplete data from seven participants were removed and so N=94 participants were included within our analyses. The mean age of participants was 19.5 years SD = 1.4 (N=91 due to missing age data for n=3 participants). The final sample consisted of 20 males, 73 females and one participant who identified as non-binary. Participants were allocated to one of the three experimental conditions, on an alternating basis.

140	Design
110	Design

A 3-way between groups design was used. The independent variable was 'Grade', which had 141 142 3 levels: High Grade (75%) (n = 33), Low Grade (45%) (n = 31) and No Grade (control group where no numerical grade was shown) (n = 30). The dependent variable was each participant's 143 144 total score on a Feedback Perception scale that was designed specifically for use in the present study. The scale consisted of seven items, each rated on a 9-point Likert scale. The items were 145 worded as follows: (i) 'How happy would you be receiving the feedback?'; (ii) 'How positive 146 147 or negative was the feedback in your opinion?'; (iii) 'How useful was the feedback?'; (iv) 'How confident would the feedback make you feel?'; (v) 'How anxious would the feedback make 148 149 you feel?' (This item was reverse coded before analysis); (vi) 'How helpful was the written 150 feedback?' and (vii) 'How likely would you be to use the written feedback to help you in a future assignment?'. The minimum possible total score was 7 and the maximum possible score 151 152 was 63; where a higher score indicated a more positive perception of the feedback the 153 participant had been asked to read. Cronbach's Alpha for the Feedback perception Scale was 154 .815 indicating a high and acceptable degree of internal consistency.

155

156 *Materials*

A short piece of written assignment feedback was created for use in the present study. The feedback was written by the lead researcher who is a university psychology lecturer with seven years' experience of providing higher education students with written feedback. The feedback was intended to contain only neutral statements about a fictitious essay, consisting of both evaluative comments and feedforward guidance. A second university psychology lecturer, with eight years' experience of giving written feedback to undergraduates, reviewed an initial draft of the statement and suggested edits. From this, a final 210 word version of the feedbackstatement was made (see Appendix A).

165

166 *Procedure*

The study was advertised on an online psychology department participant pool portal. Those 167 168 who indicated an interest in completing the online study were presented with an information sheet and consent form and then, if they wished to continue, asked to indicate their consent 169 electronically. Participants were initially asked two basic demographic questions; their age in 170 171 years and the gender with which they most closely associated (Male / Female / Non-Binary). Next, they were given the following instructions on screen: "Imagine you have received the 172 173 following feedback from an assignment at University" and were then presented with the 174 neutral feedback stimulus.

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In addition, depending on which experimental group participants were assigned to, the
feedback stimulus also contained underneath the text either (i) a High grade of 75%; (ii) a
Low grade of 45% or, (iii) for the No Grade control group, no visible grade was displayed
with the feedback. After reading the feedback, participants were then asked to respond to the
seven perception questions and were provided with debriefing information.

181

182 **Results**

To test the research Hypothesis, a one-way ANOVA was conducted with Grade as the independent variable with three levels: (None, Low, High). The total scores each participant scored on the Feedback Perception scale were used as the dependent variable. The Levene's test was non-significant (p = .911) indicating that the error variance was equal across all groups. A significant main effect was found for Grade F(2,91) = 6.69, p = .002, $\eta p^2 = .13$.

188 The significant main effect of grade on Feedback Perception scale score was followed up 189 using Bonferroni corrected pairwise comparisons (See Figure 1). The mean score for the High Grade condition (M = 44.82, SD = 6.8) was significantly higher than for the Low Grade 190 191 condition (M = 38.19, SD = 7.7, MD = 6.62, SE = 1.87, p = .002, d = .93), but not significantly different from the No Grade condition ((M = 43.1, SD = 8), MD = 1.72, p = 1). Mean scores 192 for the No Grade condition were significantly higher than for the Low Grade condition (MD 193 = 4.9, SE = 1.91, p = .036, d = .64). These findings all supported the research hypothesis that 194 the presence of a higher grade mediates a more positive perception of the written feedback. 195

196 <Figure 1 about here>

197 Next, exploratory analyses were conducted examining possible effects of the independent 198 variable Grade on the participants' responses for each of the seven individual items in the 199 Feedback Perception scale. A one-way between subjects MANOVA was conducted using the 200 participants' ratings on the seven perception questions as seven separate dependent variables. 201 Table 1 shows the mean ratings and standard deviations for all three experimental groups 202 across all seven perception questions. The Box's M test was non-significant (p = .471) and 203 therefore covariance matrices were assumed equal. The Levene's tests for all seven 204 perception questions were non-significant indicating that the error variance was equal across 205 all groups. At the multivariate level the MANOVA showed a significant main effect of the 206 Grade variable Wilks' $\lambda = .69$, F(14,170) = 2.51, p = .003, $\eta p^2 = .17$.

207 <Table 1 about here>

At the Univariate level, a significant main effect was found for the feedback condition for how happy participants would be to receive the feedback (Question i), F(2,91) = 9.07, p <

210 .001, $\eta p^2 = .17$. Bonferroni post hoc comparisons revealed that the mean happiness rating for

the High Grade condition (M = 6.42, SD = 1.71) was significantly higher than for the Low Grade condition (M = 4.52, SD = 2.00, MD = 1.91, SE = .46, p < 0.001, d = 1.04) and the mean happiness rating for the No Grade condition (M = 5.90, SD = 1.81) was also significantly higher than for the Low Grade condition (M = 4.52, SD = 2.00, MD = 1.38, SE =.47, p = .013, d = .74). The pairwise comparison between the High Grade and No Grade conditions was non-significant (p = .79).

A second Univariate main effect was found for how confident participants would feel after 217 reading the feedback (Question iv), F(2,91) = 8.01, p = .001, $\eta p^2 = .15$. Bonferroni post hoc 218 219 comparisons revealed that the mean confidence rating for the High Grade condition (M =220 5.79, SD = 1.62) was significantly higher than for the Low Grade condition (M = 4.39, SD =1.73, MD = 1.40, SE = .40, p = .002, d = .85) and that the mean confidence rating for the No 221 222 Grade condition (M = 5.77, SD = 1.38) was also significantly higher than for the Low Grade 223 condition (M = 4.39, SD = 1.73, MD = 1.38, SE = .41, p = .003, d = .9). The pairwise 224 comparison between mean confidence ratings for the High Grade and No Grade conditions 225 was non-significant (p = 1).

A third Univariate significant main effect was found for how likely students would be to use 226 227 the feedback to improve their marks on future assignments (Question vii), F(2,91) = 3.63, p =228 .03, $\eta p^2 = .07$. Bonferroni post hoc comparisons found only one significant difference 229 between conditions. The mean Likelihood rating for the High Grade condition (M = 7.30, SD 230 = 1.05) was significantly greater than the mean rating for the Low Grade condition (M = 6.35, 231 SD = 1.91, MD = .95, SE = .37, p = .038, d = .63). Pairwise comparisons were non-significant between the High Grade and No Grade conditions (p = 1.0) and non-significant between the 232 Low Grade and No Grade conditions (p = .13). 233

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Lastly, there was no main effect of the feedback condition for Question ii: how positive or negative the participants perceived the feedback to be, F(2,91) = 1.68, p = .19; Question iii: how useful participants perceived the feedback to be, F(2,91) = 1.94, p = .15; Question v:

- how anxious the feedback made participants feel, F(2,91) = .95, p = .39; or Question vi: how
- helpful the students perceived the feedback to be F(2,91) = 2.13, p = .13.

239 Discussion

240 The present study examined whether university students' perceptions of a single piece of 241 neutrally worded assignment feedback could be affected by the presence, absence and 242 numerical value of a grade. We predicted that self-reported feedback perception scores would 243 be significantly more positive for conditions where the feedback had a grade of 75 (High Grade) and the condition where No Grade was shown; compared to the feedback scores for 244 245 those students who saw a mark of 45 (Low Grade). These predictions were supported. In addition, our results indicated that perceptions of the feedback were equally positive when 246 247 compared between the High Grade group and the No Grade group. This pattern of results mirrors those found by Arnold, (2009) and Brockx et al., (2011) with respect to perceptions of 248 249 teaching quality. In those studies, the grade received mediated students' perceptions of teaching 250 quality, whereas, in the present study, the grade affected the perception of assignment feedback.

Additional exploratory analyses, conducted at an individual question level, revealed that two questions we asked which related to emotional responses to the feedback; i.e. how happy and how confident the students felt after reading the feedback, showed that students rated themselves significantly happier and more confident after reading the feedback and seeing a grade of 75, or when seeing no grade, compared to the students who saw a grade of 45. This association between a high grade and a positive emotional response relating to the feedback was expected and is in keeping with the findings of Howell et al. (2018). It is particularly

258 notable that seeing no grade also resulted in positive emotional responses which were 259 comparable to those who saw a high grade. The association between seeing a high grade and 260 positive perception of feedback is expected, but the finding that the response to the feedback 261 was also more positive when no grade was seen supports an argument that it may be better to 262 provide students with their written feedback before allowing them to see their grade. However, 263 before this could be recommended, some additional research is needed to explore whether any 264 potential post-grade change in feedback perception occurs. That is, whether a student who held 265 an initially positive view of their feedback would perceive it more negatively if the mark they 266 subsequently saw was low.

Importantly, whether the student believed they would make future use of the feedback was also 267 associated with the grade received. For the question which related to the students' self-268 269 predicted functional response ('How likely would you be to use the written feedback to help 270 you in a future assignment?') the High Grade group indicated they would be more likely than 271 the Low Grade group to use the feedback in a future assignment. However, students who did 272 not see a grade with the feedback were neither more nor less likely to say they would use the 273 feedback in future than the students who saw a high or low grade. This pattern of findings is 274 consistent with predictions based on Pekrun (2011) and Pitt and Norton (2017). Although the 275 relationship between the emotional response to the grade and the functional response is 276 complex, the typical association is that positive reactions lead to more functional use of 277 feedback (though in some cases pride can also result in complacency and less effort in future assignments (Kahu et al., 2015); whereas negative responses are more likely to result in 278 279 avoidance, anger and frustration, and lower engagement for future assignments (Pitt & Norton, 2017). Further work will be necessary to better understand the relationship between feedback 280 281 perception and a student's emotional and functional responses. To better quantify students' 282 responses to feedback it would be useful to develop a feedback perception measure which

elaborates on aspects of both emotional and functional responses to feedback. Such a measure
could build upon the adaptation of the Student Conception of Feedback Inventory (Student
Conceptions of Feedback Questionnaire-II (SCoF-II; Irving & Peterson, 2006)) to university
students used in Brown et al., (2016). However, it would be important to also include items
related to emotional responses to the existing items which are targeted largely at functional
responses.

Despite the clear pattern of findings presented in this study it is necessary to acknowledge some 289 290 limitations. Most importantly, this study utilizes a hypothetical feedback scenario in which the 291 student has no personal investment. As discussed in Pitt and Norton (2017), it is important to consider students' individual perception of their performance and the associated emotional 292 293 response to the grade and the feedback. It is necessary to acknowledge that each student has 294 their own expectation and perception of what constitutes a high/low grade for them given their 295 typical academic performance, and this would be something to control for in a future study. 296 Nonetheless, given the pattern of results obtained, in a situation in which the student has no 297 personal investment, it is likely that, in a real assessment scenario of grade and feedback 298 release, the reported pattern of findings would be strengthened in comparison with the findings 299 of the present study. A second potential concern is that the nature of the feedback used in this 300 study was necessarily neutral, and so may have been considered vague or unhelpful in an 301 assessment context. For this reason the measure of how likely students might be to act upon 302 the feedback in the present study may be lower than it would be for feedback which gives a 303 more meaningful evaluation of individual student work. This limitation may also explain the 304 null results for the questionnaire items relating to helpfulness/usefulness, positive/negative and anxiety inducement. Finally, the questionnaire used focused heavily on the students' situational 305 306 response to the feedback, with only one question considering self-regulation and future 307 learning. In future work the research design should seek to incorporate more authentic written

feedback, as well as expanding the focus on how students are likely to implement the feedback in their future work. In a larger scale study, the type of course should also be considered, as responses to feedback may differ across courses and more so between vocational and nonvocational training.

312 Summary

To the best of our knowledge, the present study provides the first experimental evidence that, 313 314 at least some, aspects of how positively or negatively students perceive written feedback are 315 mediated by the presence and numerical value of the grade that is received for the assignment. We acknowledge that the neutral nature of the feedback used and the low level of 316 personal investment the participants had in the hypothetical assignment scenario constrains 317 318 the interpretation of our findings with respect to perceptions of feedback utility. However, 319 our main hypothesis was supported providing findings in an area that is not yet well 320 researched and this study therefore makes an important early contribution. We suggest that 321 further studies are conducted within a higher education context to examine this grade-priming 322 effect under more ecologically valid conditions. That is, if the priming effect of seeing a 323 grade persists in situations where the student has a genuine emotional investment in the 324 feedback and grade they have received. The findings address a gap in the literature on 325 assessment feedback practices and can provide an important contribution towards planning 326 initiatives such as, withholding grades and developing guidance for students to build their resilience in dealing with, and acting upon feedback constructively. 327

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- 408 DOI:10.1080/00461520.2016.1207538

411 Table 1. Feedback perception scores provided by student raters who read an identically

- 412 worded paragraph of neutral academic feedback and were asked to (i) imagine they had
- 413 received this feedback for a recent assignment and (ii) respond to seven Feedback perception
- 414 questions, each scored on a 9 point Likert scale. Mean Perception Scores are shown per
- 415 question and as a function of whether the student also saw, displayed underneath the
- 416 feedback, either (i) a High Grade (75%); (ii) a Low Grade (45%) or (iii) No Grade (Control
- 417 condition). A higher score indicates a more positive response to the question

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	Grade Seen						
	No Grade (n=30)		Low Grade (n=31)		High Grade (n=33)		
Feedback Perception Question	М	SD	М	SD	М	SD	
How happy would you be receiving the feedback?	5.9	1.8	4.52	2	6.42	1.7	
How positive or negative was the feedback in your opinion?	5.67	1.3	5.03	1.6	5.55	1.5	
How useful was the feedback?	6.5	1.6	6.39	1.5	7.03	1.1	
How confident would the feedback make you feel?	5.77	1.4	4.39	1.7	5.79	1.6	
How anxious would the feedback make you feel?*	4.2	1.8	4.77	2.1	4.21	1.7	
How helpful was the written feedback?	6.33	1.5	6.29	1.5	6.94	1.2	
How likely would you be to use the written feedback to help you in a future assignment?	7.13	1.4	6.35	1.91	7.3	1.1	

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Figure 1 – Mean Feedback perception scores provided by N=94 student raters all of whom 424 425 read an identically worded piece of neutral academic feedback and were asked to imagine 426 they had received this feedback for a recent assignment and then respond to seven Feedback 427 perception questions, each scored on a 9 point Likert scale. Scores are shown as a function of 428 whether the student also saw displayed underneath the feedback either (i) a High Grade 429 (75%); (ii) a Low Grade (45%) or (iii) No Grade (Control condition where no visible grade 430 was displayed underneath the text). A higher score indicates a more positive perception of the 431 feedback.

433 Appendix A

434 'In general the writing was clear and concise but there were also a few grammatical errors. 435 *Consider asking a friend or family member to proof read your final draft as they may spot some* 436 minor errors that you missed. The structure of the essay was mostly logical, but where you 437 discussed the two sides of the theoretical argument it became a little difficult to follow. I suggest 438 that in future essays you could address this by perhaps starting with describing all the 'for' arguments and then moving on to discussing the 'against' arguments or vice versa. This makes 439 440 it easier for the reader to follow the flow of the overall points being made. Some sections of the 441 essay were appropriately referenced using mostly peer-reviewed literature. In future you could improve upon this by citing, where possible, multiple sources to support each of your 442 arguments, especially where this provides evidence of having read wider than the lecture 443 444 material. Your citations, in the main, conformed to the correct APA formatting conventions, although there were one or two which did not. The essay ended with a concise, easy to follow 445 summary of the main points you had made throughout and I would definitely advise doing 446 something similar to this in your next essay." 447

⁴³²