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"There's no good, it's just satisfactory": perfectionism, performance, and perfectionistic reactivity in NCAA student-athletes

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ABSTRACT

Perfectionistic reactivity is a characteristic style of responding to adversity that elicits a bio-psychosocial response. Those with elevated levels of perfectionistic tendencies are thought to react disproportionately in the face of successes or failures. The present two-study paper was designed to understand the role of perfectionism in predicting season-long performance in collegiate golf while also gaining insight into NCAA student-athletes' lived experiences of perfectionism and reactivity. In *Study 1*, self-report measures of perfectionism were collected from 46 NCAA golf student-athletes. Tournament scores were then recorded over the NCAA's 12-week competitive season. Data were examined using a two-level hierarchical linear model to test the moderating effect of perfectionism on student-athlete hole-over-hole performance across an entire season. In *Study 2*, semi-structured interviews were conducted with six student-athletes from the Study 1 sample who had self-reported high levels of perfectionistic strivings and concerns. Data were examined utilizing reflexive thematic analysis. Collectively, findings suggest that there is still work to be done to wholly understand the influence of perfectionism on sporting performance. However, athletes revealed during interviews that they experience perfectionistic reactivity through a multitude of biopsychosocial dimensions related to affect, behaviour, and cognition. Findings will allow future scholars to examine different measures of perfectionism across different performance intervals while considering the conceptual and empirical underpinnings of perfectionistic reactivity. Furthermore, future research could be designed to understand the specific circumstances under which specific thoughts, feelings, and behaviours are experienced in relation to perfectionistic reactivity.

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Perfectionism is a multidimensional personality characteristic comprised of two higher-order dimensions: perfectionistic strivings, and perfectionistic concerns (Stoeber & Otto, 2006). *Perfectionistic strivings* are "associated with self-oriented striving for perfection and the setting of very high personal performance standards" whereas *perfectionistic concerns* are "associated with concerns over making mistakes, fear of negative social evaluation, feelings of discrepancy between one's expectations and performance, and negative reactions to imperfection" (Gotwals et al., 2012, p. 264). The distinction between the two higher-order dimensions is important, as each has been shown to have different effects on a range of outcome variables (Hill et al., 2018). Reviews on the topic have suggested that perfectionistic strivings are positively related to an array of adaptive and maladaptive outcomes while concerns are more commonly associated with exclusively maladaptive outcomes (Hill et al., 2020).

An emerging body of literature has been dedicated to understanding the relationship between perfectionism and performance. Although these studies have historically utilised laboratory-based athletic tasks (see Hill et al., 2011; Lizmore et al., 2019; Stoll et al., 2008), a subset of work has been designed to understand this relationship in real-world, ecologically valid contexts. Specifically, research from Stoeber and colleagues (2009), Walerańczyk and Stolarski (2021), and Walerańczyk (2023) have examined performance outcomes in organised competitions. However, these studies recruited endurance athletes competing in one-off events (e.g., triathlons, 10 km runs, half-marathons, and trail races). In addition, qualitative exploration has also highlighted that perfectionistic individuals often attribute the success that they have experienced to perfectionism (Hill et al., 2015). However, in doing so, they also acknowledge that perfectionism brings about an array of interpersonal issues that may pose a threat to their broader well-being.

Perfectionistic reactivity, as defined by Flett and Hewitt (2016) is "a characteristic style of responding to adversity that includes both psychological and physiological reactivity" (p. 301). Initial work in this area suggests that perfectionistic reactivity may manifest in affective, behavioural, and cognitive responses (Flett & Hewitt, 2016). Potential *affective* responses include anger, anxiety, and depression; potential *behavioural* responses include avoidance activities, over-striving, and becoming hypercompetitive; and potential *cognitive* responses include rumination and social comparison. An important practical extension of this work is the proposal of sport-related situations where perfectionistic reactivity may be most relevant. These include failures and losses, wherein athletes experience being outperformed, not achieving their goals, having imperfections, and making mistakes (Flett & Hewitt, 2016). This thesis is supported by the existing notion that individuals with elevated levels of perfectionism experience heightened sensitivity to mistakes after subjective failures (Frost et al., 1995; 1997; Hewitt et al., 2008; Hill et al., 2011). Given the potential for perfectionism to impact how athletes respond to success and failure over repeated competitive opportunities (Flett & Hewitt, 2016; Hill et al., 2011), it stands to reason that it may be worth exploring the effects of perfectionism in competitive settings where individuals perform skills on multiple occasions within a single competition.

Given the current empirical understanding of perfectionism, it is plausible that competitive athletes who maintain high standards of performance and who compete in public settings would most likely be affected by perfectionistic reactivity. One such group is NCAA student-athletes, who, along with pursuing a post-secondary education,

participate in 20 or more hours of training and competition per week. Existing work has offered evidence for the notion that perfectionistic student-athletes strive for perpetual forward momentum, inhibiting performance contentment and emphasizing continual improvement (Gotwals & Tamminen, 2020). These qualitative findings suggest that mixed perfectionists (i.e., those that score highly on both higher order dimensions of perfectionism) are particularly vulnerable to social evaluative concerns, ruminate longer on failure, and experience stronger desires to withdraw – particularly when they perceive their legitimacy as an athlete is being questioned.

One group of student-athletes who may be especially prone to perfectionistic reactivity in the context of intercollegiate sport is golfers. Golf offers a unique setting in relation to performance feedback. Specifically, with 18 discreet performance markers per round, athletes are afforded performance feedback more frequently than athletes in continuous endurance events, such as a 10 km race or half-marathon. Due to its consistent and therefore predictable feedback structure, golf offers a setting in which athletes can compare their performance to others *and* to the pre-determined and standardised value of par, providing ample opportunity for reactive situations and perceptions of subjective success and failure. To address this knowledge gap, the present two-study manuscript was designed to understand the role of perfectionism in predicting performance in collegiate golf while also gaining insight into NCAA student-athletes' lived experiences of perfectionistic reactivity.

Study 1

Study 1 was designed to explore the potential moderating influence of perfectionism on the relationship between athletes' hole-over-hole performances in NCAA golf. In pursuing this aim, we sought to understand whether and how athletes' performance from one hole to the next differed as a function of their perfectionistic tendencies. This study extends the perfectionism literature by examining perfectionism in ecologically valid and *measurable* setting wherein repeated performances occur across a relatively short period of time.

Method

Participants

Of the 122 original participants, only 46 were included in the analyses because hole-level data were not available for 76 of the original participants. Of the final participant sample, 22 (50.0%) identified as male and 22 (50.0%) identified as female. These participants ranged in age from 18 to 24 years ($M = 20.12$; $SD = 1.47$), had played golf for an average of 10.76 years ($SD = 4.05$, range = 3–18), and had competed at the NCAA level for 2.18 years on average ($SD = 1.34$ years, range = 0–5). Participants self-identified as White (72.7%), Asian (13.6%), Black or African American (2.3%), American Indian (2.3%), and Other (9.1%). Participants represented all three NCAA divisions, with 13 (29.5%) competing at the Division I, 4 (9.1%) at the Division II, and 27 (61.4%) at the Division III level. A summary of the entire original sample can be found in the supplemental material.

Due to the novel study design and the absence of anticipated effect sizes or intraclass correlations, an *a priori* power analysis to determine a minimum sample size was not

possible (Lakens, 2022). However, Hox and McNeish (2020) offer guidelines regarding the minimum number of participants/units required at the highest level in a mixed effects model. For models fit using restricted maximum likelihood estimation, the minimum number of units is posited to be 25; therefore, the inclusion of 46 athletes in the present study appears to be sufficient, despite representing a small proportion of NCAA golf student-athletes.

Procedure

Prior to participant recruitment, study approval was obtained through a University Institutional Review Board (IRB) to ensure the protection of human participants. After study approval, emails were sent to the head coaches of all NCAA golf programmes. This introductory contact included details of the study, its purpose, potential outcomes, the requirements of student-athlete participation, and an email script with a link to the survey that coaches could send to student-athletes. Head coaches who were interested in having their student-athletes participate distributed the email script to their teams. Student-athletes who chose to participate completed the survey prior to the beginning of the NCAA's competitive golf season. The survey instrument was designed to gather sociodemographic information as well as self-reports of perfectionistic strivings and perfectionistic concerns. During the competitive golf season, performance data were collected for these athletes by querying results online at www.golfstat.com. This method of performance data collection did not place any burden on student-athletes, coaches, or staff. Identifying information (e.g., student-athlete names and universities) remained in the dataset until performance data (i.e., hole, round, and tournament scores) had been collected for the entire season and interviews for Study 2 had been completed.

Measures

Sociodemographics. Basic student-athlete characteristics were collected, including age, gender, race and ethnicity, NCAA member-institution, NCAA conference, years playing golf, and years playing NCAA golf.

   Perfectionism. The Multidimensional Inventory of Perfectionism in Sport (MIPS, Stoeber et al., 2006; Stoeber et al., 2007) was used to measure perfectionistic strivings and perfectionistic concerns. The MIPS includes two subscales: (1) *striving for perfection during training/competition* and (2) *negative reactions to imperfection during training/competition*. These subscales include five items each, such as "I strive to be as perfect as possible" and "I get completely furious if I make mistakes." In the present study, participants were asked to read the statements and indicate the degree to which each statement characterised their attitudes in sport, responding on a 5-point Likert-scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Participants were informed that there were no correct or incorrect answers and that the research team was interested only in their personal perceptions and experiences. Past research has affirmed both subscales as reliable and valid indicators of perfectionistic strivings and concerns (Madigan, 2016; Stoeber & Madigan, 2016). In the present study, MacDonald's Omegas were calculated and offered adequate support for the subscales striving for perfection ($\Omega = 0.89$) and negative reactions to imperfection ($\Omega = 0.83$).

Performance. Performance data were collected over the course of the competitive season by examining online tournament results. Data were collected by trained undergraduate research assistants who documented hole scores for each participating athlete. Data were coded analogous to conventions used in golf's stroke scoring system, requiring the calculation from raw scores to scores-to-par. Par is the expected number of strokes for a player to take on any given hole, resulting in a net score of zero. Scoring above par (an above-zero net score) indicates worse performance, whereas scoring below par (a below-zero net score) indicates better performance. Specifically, albatrosses were coded as − 3, eagles as − 2, birdies as − 1, pars as 0, bogeys as 1, double bogies as 2, triple bogies as 3, etc. Hole scores were then summed to create round scores. Hole scores in the present study formed the micro-level, while round scores formed the meso-level, and individual participants comprised the macro-level units of analysis.

Data analysis

Statistical analyses were conducted using R (R Core Team, 2022). Descriptive statistics were calculated and examined per the recommendations of Tabchnick and Fidell (2014), using the psych package (Revelle, 2024). Linear mixed-effects models were utilised to examine the potential moderation of perfectionistic dimensions on the relationship from one hole to the next while accounting for the clustered nature of the data. Adopting a multi-level approach was necessary in the present study due to the nested nature of the data (Hox et al., 2017). As multiple data points were generated from each participant (i.e., holes nested within rounds nested within athletes), this approach allowed for the inclusion of random effects which served as a statistical control of nesting effects. Due to hole level data not being available for some events – as event organisers did not make them available in the public domain, only individuals with complete hole data were included in the analyses. Further, some participants had competed in too few tournaments to create a lagged variable, as such, round was only included as a random effect, which dictated the three-level nested structure of hole, round, and individual.

All mixed-effects models were modelled using the Lme4 package in a bottom-up approach (Bates et al., 2015). A null model, which did not contain any predictors, was fit to examine intraclass correlations (ICCs), which allowed for examination of the proportion of performance variance explained at each level of clustering (i.e., hole, round, and individual). To address the primary research question, a new variable was calculated by using raw participant scores on each hole and lagging them by one unit (i.e., one hole). This lag score was used as an independent variable throughout the remainder of the analysis. It was entered into the model as a fixed-effect, fit with the restricted maximum likelihood estimator (REML), and used to test the relationship between an athlete's previous hole score and their subsequent hole score (Hox et al., 2017). At this step, random intercepts for athlete and round were included in the model. Perfectionistic strivings and concerns were entered to create two interaction terms, one between perfectionistic strivings and hole score and the other between perfectionistic concerns and hole score. This allowed us to examine whether dimensions of perfectionism influenced hole-to-hole performance. Both perfectionism dimensions were mean centred prior to being entered into the model and all predictors were entered in one step after the

calculation of ICCs from the null model. At each step, likelihood ratio tests (LRTs) were used to compare sequential models. In the event of a non-significant LRT, the previous model was identified as the most parsimonious model. Statistical significance for all tests was set at $p < .05$.

Results

Descriptive statistics

Over the 12-week competitive season, scores were collected on 3474 holes, nested within 193 rounds, across 46 student-athletes. This sample size was deemed suitable for the proposed analyses based on the recommendations of Hox and McNeish (2020). On average, participants competed in 4.19 rounds ($SD = 2.90$). Mean scores and standard deviations, Pearson's correlations, and MacDonald's Omegas can be found in Table 1.

Intraclass correlations

Prior to the formal inferential analyses, a null model containing only random intercepts for athlete and round was fit to calculate intraclass correlations (ICCs). This provided the proportion of variance in hole score explained at each level of the analysis. The proportion of variance accounted for at the round level was 1.3%, whereas between-person variance accounted for 18%, for a total explained variance of 19.3%.

Mixed-effect model

Scatterplots and Q-Q plots were fit to examine normality and homoscedasticity. Model residuals were approximately normally distributed. The first model fit included the lagged score variable to examine whether there was a significant relationship between the prior hole and the next hole. The estimates from this model provided support for a relationship between the prior hole and the next, $b = -0.04$, t (3293) $= -2.47$, $p = .014$. This model was supported by a significant LRT ($p = .021$). Although this represents a small effect and likely signifies a mean regressive effect, perfectionism dimensions were subsequently included to begin hypothesis testing. The model including main effects of perfectionism dimensions revealed non-significant estimates for both striving for perfection ($b = -0.08$, $t(3293) = -1.08$, $p = 0.287$) and negative reactions to imperfection ($b = 0.06$, $t(3293) = 0.807$, $p = 0.425$) and yielded a non-significant LRT, indicating that the model containing only the main effect of lagged score was the most parsimonious. In

Table 1. Pearson's correlations, observed mean scores and standard deviations, and Macdonald's Omegas for study variables.

	1	2	3
1. Score	–		
2. Striving for Perfection	−0.06**	–	
3. Negative Reactions to Imperfection	−0.01	0.51***	–
Mean	0.51	3.80	3.17
SD	0.94	0.99	2.80
Omega		0.89	0.83

Note: **$p < .01$. ***$p < .001$. In the current analyses, a lower value for score is indicative of better performance.

Table 2. Parameter estimates of linear mixed effects models.

	B	SE	95% CI	t	p
Null Model					
(Intercept)	0.58	0.06	[0.45, 0.71]	9.123	<.001
Previous Hole Main Effect					
(Intercept)	0.59	0.07	[0.46, 0.73]	9.005	<.001
Previous Hole	−0.04	0.02	[−0.08, − 0.01]	−2.459	0.014
Perfectionism Main Effects					
(Intercept)	0.72	0.29	[0.14, 1.29]	2.486	0.017
Previous Hole	−0.04	0.02	[−0.08, − 0.01]	−2.464	0.014
SP	−0.08	0.08	[−0.24, 0.07]	−1.080	0.287
NRI	0.06	0.08	[−0.09, 0.22]	0.807	0.425
Perfectionism Interactions					
(Intercept)	0.60	0.07	[0.47, 0.73]	9.172	<.001
Previous Hole	−0.04	0.02	[−0.08, − 0.01]	−2.467	0.018
SP	−0.09	0.08	[−0.25, 0.07]	−1.103	0.277
NRI	0.06	0.08	[−0.10, 0.22]	0.737	0.475
SP*Previous Hole	0.00	0.02	[−0.04, 0.04]	0.127	0.899
NRI*Previous Hole	0.01	0.02	[−0.03, 0.05]	0.538	0.591
Random Effects					
Athlete	0.17				
Round	0.02				
Residual	0.74				

Note: B = parameter estimate; SE = standard error; CI = confidence interval.
SP = striving for perfection; NRI = negative reactions to imperfection.

order to test for any interactive effects between perfectionism dimensions and the previous hole score, interaction terms were created and entered in the next step of the model.

This included two interaction terms between striving for perfection and the lagged hole score, and concern over mistakes and the lagged hole score. The main effects of both perfectionistic dimensions and the moderation term were non-significant, suggesting there was no effect of perfectionism on score, or the relationship between the prior hole and the next hole, after accounting for the effects of clustering. This was further supported by LRT, which was non-significant, indicating that the model containing only the main effect for previous hole was the most parsimonious. Full results are presented in Table 2.

Discussion

The present study was designed to assess the effects of perfectionistic strivings and perfectionistic concerns on hole-to-hole performance over the course of a competitive golf season. We hypothesised that perfectionism would moderate the relationship between NCAA golf student-athletes' prior hole score and next hole score once clustering effects had been accounted for. In testing this hypothesis, we found that no significant relationships exist between perfectionism, performance, and previous performance.

While perfectionism was not found to be a predictor of score, or a moderator of the relationship between scores on consecutive holes, these tests do offer value to the field in beginning to establish longitudinal evidence related to the concept of perfectionistic reactivity from which scholars can build. In the present study, perfectionistic reactivity was conceptualised and framed within the context of sport performance, utilizing a standard measure of sport performance (i.e., golf scores in relation to par) as the

dependent variable. Despite this framing, Flett and Hewitt (2016) posit that performance is just one way in which perfectionistic reactivity may manifest, noting that individuals may also experience affective, behavioural, and cognitive outcomes. While perfectionism was found to have no relationship with performance in the present study, it is certainly plausible that perfectionistic tendencies manifest in ways that were not captured in athletes' performance outcomes. Indeed, athletes' experiences of perfectionism may be better captured through cognitive and/or affective processes (e.g., stress) or by assessing non-immediate or non-sport-related behavioural outcomes.

The present study was designed to explore the potential influence of perfectionism on the relationship between prior and subsequent performance across a round of golf. Findings offered no evidence for the influence of perfectionism on this relationship at the hole-by-hole level. We recommend that future scholars test other salient outcomes such as anxiety, anger, and over-striving, while also testing across larger time increments. Doing so would enhance conceptual understanding of perfectionistic reactivity while offering a developmental lens to scholars and practitioners who wish to understand its nuanced aetiology. Furthermore, athletes' experiences of perfectionistic reactivity may be more thoroughly understood by employing qualitative data collection techniques to gain insight into an athlete's lived experience, as in Study 2.

Study 2

Study 2 was designed to better understand how NCAA golf student-athletes experience reactivity in the aftermath of positive or negative performance outcomes. Relatively little qualitative work has been designed to highlight athletes' experiences of perfectionism in sport, and to the author's knowledge, none has been dedicated to understanding perfectionistic reactivity specifically. In building from Study 1, this study affords researchers and practitioners' further insight into perfectionistic reactivity with the potential to inform future research and practice. Combined, these studies shed light onto the role of perfectionism in high-level competitive performance while also offering rich qualitative insight into the perceptions and experiences of NCAA golf student-athletes with regards to perfectionistic reactivity.

Method

Participants

Utilizing two inclusion criteria, 24 individuals who took part in Study 1 were invited to participate in Study 2. Specifically, student-athletes were invited to participate in Study 2 when they indicated at the conclusion of Study 1 that they would be interested in participating in a follow-up interview *and* they scored above the sample mean for both striving for perfection ($M = 3.80$, $SD = 0.99$) and negative reactions to imperfection ($M = 3.17$, $SD = 2.80$) subscales from the multidimensional inventory of perfectionism in sport (MIPS, Stoeber et al., 2006; Stoeber et al., 2007). Of the 24 individuals who were invited, interviews were ultimately conducted with six student-athletes who accepted the invitation. When asked, all six participants self-identified as a perfectionist in golf to begin their interviews. Participants ($M_{age} = 20.67$ years, $SD = 1.97$) identified as female ($n = 4$) or male ($n = $

2), White (*n* = 4) or Asian (*n* = 2) and participated at the NCAA Division I (*n* = 2) or Division III (*n* = 4) level. When considering this sample size, it seems appropriate given the notion of information power (Malterud et al., 2016). Malterund and colleagues (2016) propose 5 parameters that will influence the sample requirement for qualitative interview work; (a) study aim, (b) sample specificity, (c) use of established theory, (d) quality of dialogue, and (e) analysis strategy. In the present study, the aim is particularly narrow, the sample was highly specific, we used established theory to guide the project, and the dialogue was strong. This combination of characteristics suggests that a smaller sample size may be entirely appropriate (Malterud et al., 2016).

Procedure

Potential participants were contacted through the email addresses they voluntarily provided at the conclusion of Study 1. Participating student-athletes engaged in individual, semi-structured, Zoom interviews following the NCAA's spring 2022 competitive golf season. Utilizing Zoom as an online interview platform provided many advantages to conducting traditional face-to-face interviews (Archibald et al., 2019).

   Prior to the study, a pilot interview was conducted to test the data collection protocol (see Appendix B) and results were used to refine the interview guide. Specifically, the inclusion of shot-to-shot reactivity questions were included, such as "after a bad shot, what types of thoughts, feelings, or behaviours do you experience." The six study interviews lasted an average of 35.04 min (range = 31.08–46.50 min; *SD* = 5.91). Participants were asked a battery of questions designed to elicit rich insight into their perceptions and experiences of perfectionistic reactivity. General and interview-specific probes were used to further explicate their experiences. Once data were collected, files were anonymised to protect participant identities.

Researcher positionality

The authors acknowledge that they brought their own values and biases to interactions with participants and throughout the processes of data analysis and interpretation (van der Walt, 2020). As such, it is important to explicate the specific experiences and perspectives that may have influenced the outcomes of Study 2. The first author spent two years competing as an NCAA Division I student-athlete and over a decade competing as a national-level athlete in track and field in the United Kingdom. The second author was a two-sport NCAA Division I student-athlete and played multiple seasons professionally. Both authors self-identify as perfectionists in their athletic endeavours. This provided the authors a shared experiential platform from which they could relate to participants' experiences as college student-athletes with elevated levels of perfectionistic tendencies. Further, the first author has been active in perfectionism and quantitative research for 5 years, while the second author has extensive experience in both quantitative and qualitative methods.

   In the present study, the authors adopted an interpretivist approach to research and data analysis (Levers, 2013). An interpretivist paradigm is the combination of a relativist ontology (capturing the notion that reality is a subjective experience capable of multiple interpretations, with the number of realities matching the number of individuals) and a

subjectivist epistemology (understanding that knowledge is a product of our interpretation at the intersection of our language, gender, social class, race, and ethnicity) (Lincoln & Cannella, 2004). However, as highlighted by van der Walt (2020), researchers must go beyond stating their ontological and epistemological assumptions to demonstrate how their paradigmatic approach shaped a study's procedure. The researchers believe that humans and human behaviour is distinct from physical phenomena as meaning is constructed because of the individual, the time, and the context (Alharahsheh & Pius, 2020; Levers et al., 2013). In line with the exploratory nature of Study 2, utilizing an interpretivist paradigm allowed us to pursue rich insights from student-athletes at a meaningful time and in a salient context to their personal and athletic development (Alharahsheh & Pius, 2020). Collectively, our approach to Study 2 represents a conscious decision to elevate the voices of athletes by allowing them to each describe their own realities. Further, in identifying this approach, as well as the authors' backgrounds and prior experiences, we understand that participants' experiences are analysed and filtered through the author's biases, which results in a new, co-constructed reality.

Data analysis

Interviews were digitally recorded, transcribed verbatim utilizing Otter software (Otter, 2022), and cross-checked for accuracy by three trained undergraduate members of the research team. Reflexive thematic analysis was conducted in accordance with the recommendations of Braun and Clarke (2019). Specifically, transcribed data underwent a six-stage process of (1) familiarisation, (2) initial coding, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) writing the report. Specifically, we began by immersing ourselves in the data to understand its depth and breadth and get a comprehensive sense of the content and context of participants' experiences. We then identified and systematically coded significant features of the data, looking for patterns and connections among participant experiences. We then refined the themes, checking whether the themes represented the entire dataset. After finalizing the themes, we named and defined each theme, ensuring they were distinct from one another. Finally, we produced a detailed narrative of the thematic analysis in the present Results section. Where appropriate, we use quotes and examples from the data to support the themes and provide evidence for our findings.

Although the six-stage process was largely inductive, deductive coding processes were utilised in the final two steps to analyse and interpret study data. Specifically, after inductive codes were generated from the raw data, they were subsequently grouped deductively into the three higher-order categories of behavioural, affective, and cognitive reactivity. This decision aligns with the recent conceptual proposal of Flett and Hewitt (2016) allowed the present work to be grounded in *a priori* theory while also providing space for the unique representation of participant experiences. Raw data, thematic meaning units, and higher-order themes were managed using NVivo13 version 1.7.1 software (Lumivero, 2022).

To improve the rigour of the analytic process, the second author undertook the role of critical friend, offering critical feedback on the first author's interpretation of study data. The purpose of critical friendship is to stimulate reflexive and critical dialogue among a research team and to encourage reflection upon, and of, alternate interpretations of

data and themes (Smith & McGannon, 2018). Engaging in critical friendship resulted in the production of a rational and conceptually driven argument for the depiction of the themes and codes identified during data analysis. Ultimately, eight changes were made because of engaging in this critical friendship process: four themes and one code were renamed, one code was moved into a different theme, and the ordering of codes within two categories were changed.

Results

Affect, behavioural, and cognitive reactivity

Forty-one codes of athlete's lived experiences with perfectionistic reactivity were identified throughout data analysis (see Table 3). Each code was structured hierarchically into one of nine themes, representing grouping of similar codes. Finally, each theme is situated within one of three broad categories: affect, behavioural, or cognitive. The hierarchical structure of these results is illustrated in Table 3 and textual representations utilizing participant quotes are presented below.

Affect. Participants indicated that their perfectionistic tendencies and reactivity had influence on their emotional states when participating in golf. Within this category, themes of negative affect, positive experiences, and emotional regulation were identified through their underlying codes. Athletes discussed experiences that exemplified negative affect, including anger, anxiety, and frustration. In some cases, athletes shared their experiences of frustration on a golf course when unexpected outcomes occur. This was exemplified in a quotation from Participant 3:

> So, I try to hit it through the hole in the tree and it goes right behind me … in that moment, your thoughts are all scrambled you're like "holy crap I don't know what to do." … you're kind of mad at yourself, you're down because you're trying to kind of force your way and you know, you want to you want to make a cut.

In other cases, participants indicated that they felt upset. This appeared to be the case largely when their performance processes did not meet their expectations: "If I make a bad swing, I'll be upset because it didn't feel right, it didn't sound good, it didn't look pretty." In a similar fashion, anger and hopelessness were codes identified in the data that related to athletes' experiences when performance did not match their expectations or anticipated outcomes.

Conversely, athletes also regularly cited positive experiences that come with participating in NCAA golf. Participant 1 discussed how they felt when they broke a course record during their career. Reflecting on this experience, they highlighted that they felt "relaxed" and could enjoy the round:

> Um, definitely positive. And definitely relaxed. Like, it was just, I've reflected on like, holes like that. And I'm like, "oh, it was so easy." Like when I broke the records, and I shot 69, I was like, "oh my gosh, like, that was such a relaxing round." I could just like enjoy myself. It was positive.

Finally, emotional regulation was featured heavily in athlete's discourse. Athletes emphasised the importance of maintaining a consistent temperament throughout a round. Athletes discuss utilizing self-talk to maintain a positive attitude and avoid experiencing peaks and troughs in emotion. This is exemplified in this quotation from Participant 3:

Table 3. Categories, themes, and codes of affect, behavioural, and cognitive perfectionistic reactivity.

Category
  Themes
    Codes
Affective
  Negative Affect
    Anger
    Anxiety
    Embarrassment
    Frustration
    Hopelessness
    Upset
    Worry
  Positive Experiences
    Enjoyment
    Relaxing
  Emotional Regulation
    Even-tempered
    Staying positive
    Remaining calm
Behavioural
  Pre-performance
    Preparation
    Routine
  During performance
    Adjusting play style
    Kinesthetic awareness
    Do what you know
    Stepping back
    Trying too hard
  Post-performance
    Over Adjustment
    Management of Self-Image
  Cognitive
    Reflection
      Recovering mid-performance
      Reflecting on past performance
      Focus on the bad
      Rumination
  Preflection
    Reframing
    Self-awareness
    Self-compassion
    Present moment
    Striving for Excellence
    Pragmatic Approach
    Strategies to help
    Focus on the *next* hole
  Context specific expectations
    Searching for consistency
    Goals and Standards
    High performance standards
    Managing expectations
    Overcompensation
    Self-pressure
    Aesthetic vs functional
    Spiralling

So, for me, it's, it comes back to that self-talk of "hey, I have to stay as positive on the golf course as possible," doesn't matter … if I just made an eagle, or if I just made an eight, I have to be … remaining in that one level. Because up and down for me, it just doesn't work.

Behavioural. Participants also discussed behavioural reactions in depth throughout their interviews. These codes were split into three themes; pre-performance, during performance, and post-performance, indicating three distinct temporal periods where reactivity influenced their behaviour. These themes capture codes such as preparation, adjusting play style, and over adjustment.

Preparation was a salient code in the pre-performance context. Along with this, athletes discussed their pre-competitive routines and how they often remain the same or strive to maintain a consistent routine prior to a round or a shot. Cases of this involved their preparation, with Participant 1 highlighting that they meticulously prepare their clothes and clubs the night prior to competing:

> Before every tournament, the night before, I'd cleaned my clubs, I'd iron my outfit, like my uniform, like I had to have everything ready to go. my teammates would say like, "why do you iron your outfit?" And I was like, "well, there's a saying like, if you feel if you feel like you look good, then you'll play good." So, then I would always just do that.

Multiple reactions during performance were discussed by athletes. These typically involved athlete's reacting to their performance during their last shot. Specifically, it was noted that after a poor performance, athletes adjust their play style and/or begin trying too hard. Participant 3 stated how they go into "attack mode" and began playing more aggressively to make-up lost ground:

> So, I went straight into attack mode, and I was playing risky shots, hit a bad drive into the trees and I'm like, "hey, well, bad drive … " So, I'm looking for the tightest gap possible and try to get the ball out of the trees trying to advance as far as possible. "Still make a number here." Well, that didn't work out. I had a tree that went about 100 yards backwards.

Participant 1 highlighted how they would find themselves "trying to force it" and attempt to recreate the quality of play that they produced when performing in the best round of their career: "I, you know, kept replaying, like, 'how I would play every hole when I shot 69?' And I would try to replicate it. And I would like, force it so hard, and it wouldn't go right."

This often resulted in poorer performance according to this participant, with the resulting play not representing the quality that they were searching for. Finally, athletes described themselves engaging in post-performance behaviours. One of which was over adjustment. Participants frequently cited that they would make changes to their swing in the hope of compensating for mistakes made in the prior shot. It appears that this often resulted in another mistake, as they did not make the same mistake, but have since adjusted as though they would replicate the error. This was exemplified in this quotation from Participant 1:

> Um, so I'll reflect on like, if I hit it, like, let's say [out of bounds] right, then I'm like, "Okay, let's aim left and make that same swing and just play for it." Well, then I'll end up probably hitting it left because I'll actually make a good swing. And then I'm in more trouble.

Cognitive. Finally, participants spoke broadly about cognitive themes that related to their reactivity, often thinking about past performances in reflection, future performances in preflection, or their perfectionistic goals and standards.

In reflection, participants frequently cited that they would focus on the bad. Of note is that participants seem to weigh poor outcomes more heavily than positive or desirable

outcomes. This disparity in the relative weight of outcomes led to one athlete stating that "There's no good, it's just satisfactory," highlighting a dichotomy of thought where the desired outcome is expected, so achieving it is believed to be the typical outcome, leaving no room for relative joy. Meanwhile, there is exponential potential for a poor performance to weigh on an athlete's cognitions, leaving little room for experiencing positive affect. In full, Participant 6 stated:

> And so, that's probably the issue, more so than anything else is that I don't keep them at the same level. Like they're not weighted the same, because one is an expectation and one is like then worse than what you expected. Like, there's no good, it's just satisfactory. And stuff, if that makes sense. Like, you've either achieved or not achieved. And then for the bad ones, it's then ranked on like a scale of like, oh, that was a really bad shot versus like kind of bad shot versus like, you know, a bad shot. So, like, the bad shots have like a thing of a ranking, almost. And then the good shots are just like you achieved or didn't achieve. And so, in terms of that thing of like, how long it stays with you or not the reason why the good shots just kind of blow by is because it's a very easy pass or fail kind of thing.

In preflection, athletes utilised techniques to help re-center themselves before their next performance. Athletes discussed how their coaches aid them in reframing their cognitions in a way that puts them in a position to approach the next hole with a more positive frame of mind. Specifically, Participant 2 discussed how their coach encourages them to add a score to par, to help them accept a bogey as a reasonable performance if prior performance has gone awry:

> And she'll tell us, "okay, this is a par four, it's a par five for you now." So, five is a good score on this hole, if you get a 6, okay, you kind of, you kind of messed up somewhere else, too, you get a four, that's a bonus, because you put yourself in a bad position. So, I like to look at it that way.

Another strategy that athletes used in preflection was self-compassion. Participants discuss how an understanding and acceptance that not every performance can be perfect helped. This appeared to be a new revelation to some athletes, who seemed to have been unaware of this in the past:

> So, that kind of opened my eyes like, "wow, like, you know, every shot isn't gonna be right at the pin." So, I got to kind of let it go and be okay with it being just an okay shot. Not perfect.

In addition, participants noted that their perfectionistic tendencies and expectations are context specific, within the sports domain. Specifically, it is noted that participants have higher expectations in practice, where they are in low-pressure environments and working on their craft. It was mentioned that there are uncontrollable aspects that may influence performance outcomes when competing on a course as opposed to the relatively isolated setting of a driving range or putting green. This was directly seen in this quote from Participant 3:

> Um, I would say it's definitely more in practice than in play because in play, I mean, you know, just stuff happens like you can't control everything that happens out on the golf course. Um, so in practice, I'm definitely, you know, trying to find that perfection, and, you know, trying to really hone into skills and make sure we're as good as possible … when I'm out playing in tournaments and just play, you can't control what happens, you get a crappy bounce … something goes wrong, like, that's a little different, but in practice, play more seeking that. That perfectionism and just trying to, like, lock it in in practice rather than in play.

Finally, participants frequently referenced their goals and standards in relation to their cognition. In these discussions, it was noted that participants adjust their expectations depending on context specific cues, but occasionally find themselves "spiralling" after making a mistake. Participants noted that depending on how they are playing they will consider adopting different clubs for certain situations but try to avoid striving for perfection. In some senses, almost moving to a "good enough" approach to the game, as shown in this quotation from Participant 2:

> So, I tend to play a little bit more conservatively when things are going wrong … I'm usually not thinking of playing conservatively. I do stop going for pins, sometimes if I know that I'm not shooting well … it's more of just "get on the green and two putt and walk off of there" kind of thing.

In addition, spiralling was a salient theme throughout the interview process. Participants noted that occasionally they will get "in [their] head" and begin to play worse, occasionally finding themselves in a downward spiral. It was highlighted that these spirals can be unpredictable, sometimes the athlete is able to recover, but other times they cannot; often utilizing self-talk to get themselves to the end of the hole to reset and move on to the next performance:

> But I'm like, kind of like mean to myself in my head … I'll, like, think in my head, like, "come on [Participant 5]" like "get your crap together. This is this is not what we want to do right now." So yeah, I kind of like say stuff like that to myself. When I'm like having a really bad hole, if I'm like, spiralling then. Sometimes I can get out of it. Sometimes I can't. And I kind of just have to like, I just tell myself, "okay, just get, just get to the next hole, and then get to the one after that." And sometimes, like, I guess, yesterday, yesterday was probably a spiral, the first front nine, I was really struggling. And I really, I really wanted to like just like, not keep playing, but I was like, "just get to the next hole and just hit the next ball. Just keep hitting it." And by the time, you know, you look up, it'll you'll be done with the round, and you can go home and go to bed and start over and reset.

Discussion

The present study was designed to answer the following research questions: (1) How do NCAA Golf student-athletes react in the light of positive or negative performance outcomes while playing? (2) How do NCAA Golf student-athletes view perfectionism in sport? To address these questions, in-depth, semi-structured interviews were conducted with six NCAA golf student-athletes. These interviews afforded a rich understanding of these athletes' lived experiences of perfectionism and perfectionistic reactivity. In analysing and interpreting interview transcripts, we grouped the data deductively into three broad categories of perfectionistic reactivity: affect, behavioural, and cognitive. This strategy aligns with conceptualisations of perfectionistic reactivity proposed by Flett and Hewitt (2016) and accounts for the nine themes and 41 codes derived from our inductive coding process.

Findings from the present study align broadly with existing literature on perfectionism and perfectionistic reactivity. While the work of Flett and Hewitt (2016) served as a guide for our study design and more specifically for the deductive framework that shaped our coding strategy, previous empirical work offers support for many of our findings as well. Anger was identified as a salient aspect of participant affect. This

buttresses the findings of Grugan and colleagues (2020), who identified significant relationships between perfectionism and angry reactions in team sport. Other codes relating to athlete affect included anxiety and hopelessness, both of which have received empirical attention in relation to perfectionism in and out of sport (Hall et al., 1998; O'Connor & O'Connor, 2003).

When considering the codes situated within the behavioural category, those in the pre-performance theme: preparation and routine, present similarly to the dimension identified by Frost and colleagues (1990) as a preference for order and organisation. Overcompensation has also been identified empirically as a problem for perfectionistic athletes (Klockare et al., 2022). Overcompensation was identified by mental performance consultants as a behaviour that perfectionistic athletes often engage in which typically resulted in maladaptive outcomes such as reduced recovery and subsequent performance (Klockare et al., 2022). Finally, cognitive themes identified in the present study reinforce those identified in prior work, quantitative, qualitative, and conceptual in nature, examining perfectionism (Hall et al., 2012; Rees et al., 2016; and Gotwals & Spencer-Cavaliere, 2014). In identifying these codes, including rumination, performance standards, and the management of expectations, the present study offers additional evidence for the salient nature of cognitive dimensions of both perfectionism and reactivity. Gotwals and Tamminen (2020) also found that athletes often experienced rumination on mistakes when their performances did not lead to forward momentum. They highlight how athletes noted that losses "stuck with me" (Gotwals & Tamminen, 2020, pg. 37), in a similar manner to how athletes in the present study found themselves focusing on poor performances much longer than they did on positive outcomes.

Athletes in the present study frequently cited instances of what was identified as self-compassion. Self-compassion is defined as the ability to recognise, and desire to alleviate, one's own suffering in a particular situation (Neff, 2003). Importantly, Neff identifies that self-compassion involves the understanding of one's pain, inadequacies, and failures in a non-judgmental way. As highlighted by Cormier and colleagues (2023), sport offers a domain in which pain, inadequacies, and failure are inevitable, therefore highlighting the potential for self-compassion practices to be a powerful tool for athletes. This notion is evidenced by the findings of empirical work examining the mediation effects of self-compassion between perfectionism and well-being (Stoeber et al., 2020), depression (Ferrari et al., 2018), and burnout (Turkal et al., 2018). Furthermore, self-compassion interventions have been shown to be effective in managing rumination, and concern over mistakes in female athletes (Mosewich et al., 2013). Considering the present findings, it appears that athletes know that self-compassion and understanding is important in managing their perfectionistic tendencies and reactivity, yet often struggle to do so. This is particularly evident in the immediate aftermath of a poor performance, where athletes cite that it is more difficult to be kind to themselves and avoid rumination on failures in this scenario when compared to a success. A particularly important progression in the adoption of self-compassion as a coping strategy is shifting to a new norm (Mosewich et al., 2019). If those proximal to athletes in their sport context (Dorsch et al., 2022) can enable the athlete to accept self-compassion as necessary and relevant to their performance and well-being, then they are more likely to reap the potential benefits.

General discussion

The present two-study manuscript was designed to understand the role of perfectionism in predicting performance in collegiate golf while also gaining insight into NCAA student-athletes' lived experiences of perfectionistic reactivity. As highlighted by Flett and Hewitt (2016), perfectionistic reactivity is of particular interest when imperfections and/or inadequacies are shown, or when performance goals are not attained. The present paper offers an innovative approach to the study of perfectionistic reactivity, and in doing so, provides novel insights into the theoretical concept.

Study 1 appears to be the first to examine the effects of perfectionism on the relationship between prior and subsequent performance in a season-long, ecologically valid, sport setting. This is an important step in beginning to understand perfectionistic reactivity and may serve as a catalyst for future work aiming to examine the potential mediating pathways through which affective, behavioural, and cognitive manifestations of perfectionistic reactivity may influence performance. Study 2 offers early empirical support for the proposals of Flett and Hewitt (2016), who proposed and defined the concept of perfectionistic reactivity. It also complements the existing empirical work of Curran and Hill (2018), who posited that athletes' perceived failure in competitive tasks is related to affective responses such as decreased feelings of pride and increased feelings of guilt. Our findings support the work of Waleriańczyk and colleagues (2021), who found that perfectionism and goal-realisation are related to athletes' post competition mood regardless of their perceptions of success or failure. Combined, this emphasises the importance of understanding how perfectionistic athletes may respond to their own performances in competitive situations.

In the present paper, NCAA golf student-athletes discussed reactivity in relation to their affect, behaviour, and cognition, highlighting how, they experienced changes across these domains in the face of failure. When examining participants' experiences identified in Study 2, none of them referred to performance improvements or decrements because of perfectionistic reactivity. However, student-athletes often discussed behaviours or cognitions that could be interpreted as intermediate/mediating processes between reactivity and performance. Specific examples included adjusting their play style (changing their behaviour to approach the course more passively or aggressively), over-adjustment (aiming left after a shot that went right), or overcompensation (thinking about potential adjustments to make considering the prior outcome). These findings align with existing qualitative exploration into perfectionism in that athletes continued their effort regardless of the result (Gotwals & Tamminen, 2020) and demonstrated a drive to achieve (Hill et al., 2015) illustrated by the themes "focus on the next hole" and "searching for consistency." On the other hand, Hill et al. (2011) found that athletes have also withdrawn effort rather than persist after receiving failure feedback. Findings from Study 2 also supported the concepts of "continued rumination on failures" and "concerns related to social evaluation" (Gotwals & Tamminen, 2020) by discussing their tendencies to focus on the bad, ruminate, and be embarrassed by poor performances. To investigate these factors in a thorough and systematic way, future longitudinal research, informed by findings from these and other qualitative studies, should be designed to identify potential mediation pathways whereby affective, cognitive, and behavioural reactivity components may facilitate the relationship between perfectionism and performance.

The temporal nature of perfectionistic reactivity also warrants future consideration. Of note, student-athletes discussed a delayed response to imperfect performances, opting to make mental notes of imperfect performances to work on during practice next week rather than addressing it or reacting in the moment. A design similar to Study 1 could be adopted to examine the varying time intervals upon which perfectionism influences performance. It is plausible that reactivity is more trait-like and therefore does not manifest in immediate performance. Instead, scholars should examine whether the effects of perfectionism impact athletes over days, weeks, months, or even seasons of competition. To engage in such work, researchers could utilise methods such as ecological momentary assessments to collect data regarding athletes' immediate thoughts, feelings, and behaviours whilst in competition. When utilizing a person-centred approach, it would also seem appropriate to examine general life stressors in relation to stress-reactivity (Hewitt & Flett, 2002). This is of particular concern for student-athletes, as they encounter a large range of experiences in and out of sport and the spillover of stress into other domains (i.e., academic, social) is not uncommon (see Honda et al., 2023; Lopes Dos Santos et al., 2020;).

Importantly, the present paper provides an opportunity to consider work across academic fields to situate its findings within broader literature. One such opportunity lies in the knowledge and understanding that comes from behavioural economics. Within this field, prospect theory (Kahneman & Tversky, 1979) offers a unique lens through which to view the present findings. Specifically, it offers distinct and potentially informative insight into the processes that are undertaken when individuals make decisions under risk, a situation that athletes frequently find themselves in (Vaughan et al., 2018). Explicitly, prospect theory offers insight into the evaluation of different outcomes as an individual's point of reference serves as a way through which to evaluate hypothetical outcomes as "gains" or "losses" (Kahneman & Tversky, 1979). Student-athletes participating in Study 2 often described the nature of perfectionism and their expectations for performance. They noted that they expected perfect performance, regardless of the odds. Prospect theory identifies three principles that govern individual's decision making in these situations: (1) evaluation to a reference point; (2) diminishing sensitivity; and (3) loss aversion (Kahneman, 2013). In particular, the notion of reference points and loss aversion were common themes throughout the interviews in Study 2. As such, prospect theory is presented as a potentially useful framework for interdisciplinary research exploring perfectionism and decision making, in sport and out.

Limitations and future directions

The strengths of the present two-study paper should be viewed in light of a few important limitations. First, to the author's knowledge, there is no established measure of perfectionistic reactivity in the academic literature. Creating and validating a reliable measure, be that psychometric or observational, for this construct presents itself as a challenging but potentially fruitful line of work for future scholars. Because research on perfectionistic reactivity is in its relative infancy, qualitative exploration presents itself as a particularly useful tool to begin to understand athletes' understanding and lived experiences of perfectionistic reactivity. On the topic of measurement, Hill and colleagues (2020) have highlighted the numerous indicators of perfectionism currently in use. While it may be

expected that these measures behave in a similar way (Gaudreau, 2016), this is not always the case (Hill et al., 2018; 2024). In fact, it has been proposed that different indicators of perfectionism may be a moderating factor for a range of outcomes. Therefore, it may benefit scholars to replicate the present study using a range of indicators of perfectionism in sport such as the Performance Perfectionism Scale for Sport (PPS-S; Hill et al., 2016) and testing for perfectionistic tipping points across time (Hill, 2021).

A second notable limitation of Study 1 is that it was only designed to test one dependent measure – NCAA athletes' golf scores in relation to par. While athletic performance is a salient concern for elite level athletes and coaches, there are an array of outcomes that may be of broad interest to those who experience perfectionistic tendencies, and of specific interest to NCAA student-athletes. Flett and Hewitt (2016) highlight numerous potential indicators of perfectionistic reactivity, including anger, rumination, and compulsive over-striving. Further, the MIPS (Stoeber et al., 2006; 2007) was utilised to capture perfectionism dimensions due to its subscale "negative reactions to imperfection" and its face validity for the reactivity component of the current study. However, other measures could have been adopted specific to performance such as the performance perfectionism scale for sport (PPS-S, Hill et al., 2016).

Finally, as with most studies examining negative phenomena in sport, attrition bias may have played a role in our findings across both studies. Indeed, all our participants were current NCAA student-athletes. Our recruitment approach necessarily excluded individuals who had previously discontinued participation in competitive sport, leaving a potentially biased sample of student-athletes (especially in Study 2) who had continued their participation to the highest level of amateur athletics in the United States. This sampling strategy excluded individuals who were unable, or perceived themselves as unable, to manage the burden of perfectionistic tendencies in sport (see Hill et al., 2015). As a result, the experiences of disengaged individuals were not captured in the present work. Future research should be designed to purposefully target this demographic to provide a more representative documentation of perfectionistic experiences in sport, particularly with regard to reactivity and its potential link to sport deselection, withdrawal, or retirement.

Conclusion

The present two-study paper utilised quantitative and qualitative approaches to examine perfectionistic reactivity in intercollegiate sport. In doing so, it represents the first empirical effort toward understanding perfectionistic reactivity in an ecologically valid, competitive sport setting. Perfectionistic reactivity seems to have the potential to influence athlete's affect, cognitions, and behaviours; however, performance does not appear to be directly impacted by its presence. A key finding is that perfectionists seem to view losses as more impactful than gains, likely a result of high-level athletes' reference point being "perfect" performance. Importantly, findings from the present work indicate that perfectionistic reactivity may be related to a multitude of athletic experiences, spanning the affective, behavioural, and cognitive domains. As such, perfectionistic reactivity is an important concept to understand as it relates to athletic performance and well-being. Further work is needed to develop a deeper understanding of how reactivity might influence athletic performance over time and across sport contexts.

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Disclosure statement

Data availability statement

Data will be made available upon reasonable request to the corresponding author.

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