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Hill, Andrew P., Jowett, Gareth E. and Mallinson-Howard, Sarah H. (2017) Perfectionism in Sport, Dance, and Exercise. In: Stoeber, Joachim, (ed.) The Psychology of Perfectionism: Theory, Research, Applications. Routledge

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RUNNING HEAD: Perfectionism in Sport, Dance, and Exercise

Perfectionism in Sport, Dance, and Exercise

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— 8,274 words (including 1 table) —

Overview

Perfect performance, flawlessness, and the perfect body are revered in sport, dance, and exercise. As such, sport, dance, and exercise provide ideal domains in which to study perfectionism. This chapter provides an overview of research that has examined multidimensional perfectionism in these domains. We place particular emphasis on the most recent research in this area and provide suggestions to guide future research. It will be argued that perfectionism is a complex characteristic with particular relevance in sport, dance, and exercise. In addition, in its various guises, perfectionism can be problematic, beneficial, and also ambivalent with regards to motivation, well-being, and performance. To better understand the effects of perfectionism in sport, dance, and exercise, we call for research that adopts longitudinal designs, examines moderating factors, develops and refines measurement tools, and focuses on the influence of perfectionism among exercisers.

Introduction

It is common for athletes and dancers to describe themselves as perfectionists. Some of the notable examples we and others have previously highlighted include world champions from various sports (rugby: Jonny Wilkinson; snooker: Ronnie O'Sullivan; cycling: Victoria Pendleton), multiple Grand Slam winners (Andy Murray, Andre Agassi, John McEnroe), and celebrated professional dancers (Karen Kain, Daria Klimentová). We believe the accounts of these individuals serve to illustrate both how common perfectionism is in these domains and the complexity of perfectionism. On the one hand, the aforementioned individuals are all extremely

successful and often attribute their success, at least in part, to perfectionism. On the other hand, in each case these individuals have described how their perfectionism has had a detrimental impact on their motivation, well-being, and performance at one time or another.

The complexity of perfectionism is readily apparent in the accounts of other self-identified perfectionists and is worth briefly exemplifying again here. The professional tennis player Eugenie Bouchard provides a recent case. Following a breakthrough year when she was named WTA Newcomer of the Year (2013), and a season in which she reached the semifinals of the Australian Open and French Open and the final of Wimbledon, Bouchard suffered a huge loss of form that included a series of early round losses to qualifiers and unseeded players. As a result, having started the year with an ATP ranking of 7th in the world, she finished the year ranked 48th. In explaining her performance slump in interviews to the media, she described the mounting sense of pressure she experienced from the outside world, the inability to cope with the subsequent stress, and—significantly—the inability to satisfy her own desire for perfection (Flatman, 2015; Osmond, 2015).

The swimmer Amanda Beard is another case, albeit more extreme. A four-time Olympian (1996, 2000, 2004, 2008) and winner of seven Olympic medals (two gold, four silver, and one bronze), she has recounted in her autobiography how throughout her career she struggled with depression, bulimia, self-harm, and drug abuse (Beard, 2012). In doing so, she described the sense of pressure she experienced as a result of her own standards and the need for every dive to be the "perfect dive" and every turn the "perfect turn" (p. 107). This left her exhausted and took a heavy toll on her mental health. Dissatisfaction with her body was particularly central to her experiences. She describes how she "wanted to be a great and fast swimmer, but more than that I wanted to be pretty, skinny, and perfect" (p. 101). The dual nature of perfectionism as both a powerful motivational force and, at the same time, a source of psychological difficulties is

summarized poignantly by Beard: "The perfectionist drive that made me a star athlete in the water, out of the water tore me apart. As I nitpicked every little aspect of myself, I discovered over and over again that I wasn't any good" (p. 89).

To further complicate matters, views vary among researchers and practitioners interested in perfectionism with regards to its likely consequences. Some hold the view that in some guises perfectionism can be healthy and a defining characteristic of elite performers (e.g., Dunn, Causgrove Dunn, Gamache, & Holt, 2014; Gould, Dieffenbach, & Moffett, 2002; Henschen, 2000). Others argue that perfectionism is likely to have few desirable longterm effects and is instead a significant vulnerability factor for athletes to possess (e.g., Flett & Hewitt, 2014, 2016; Hall, 2016). Whether perfectionism is something to be encouraged or avoided is a question that forms the backdrop for the current chapter. It is ultimately an empirical question that can be answered through the systematic study of perfectionism in athletes, dancers, and exercisers. As will be evident in this chapter, researchers and practitioners have dedicated considerable time to uncovering the correlates and consequences of perfectionism and, whereas there is still a considerable way to go, we are making good headway in terms of answering this question.

Research examining perfectionism in sport, dance, and exercise began some 25 years ago. Frost and Henderson (1991) examined the relationship between perfectionism and reactions to mistakes during competition among athletes. At a similar time, Szymanski and Chrisler (1991) compared athletes and non-athletes in terms of factors common among those with eating disorders, and one of these factors was perfectionism. The earliest studies in dance and exercise were published at a similar time (Archinard & Scherer, 1995; Davis, 1990). However, most of the research in these three domains has appeared much more recently. Based on the review of research presented in this chapter and elsewhere (Jowett, Mallinson, & Hill, 2016), we estimate that approximately 75% of all empirical studies examining perfectionism in sport, dance, and

exercise have appeared in the last 10 years compared to 25% in the 15 years before. The field has now grown to the point where we have recently been able to dedicate a special issue of the *International Journal of Sport Psychology* to this topic as well as an edited book (Hill, 2016; Hill, Appleton, & Hall, 2014)

In this chapter we aim to illustrate the findings of research in sport, dance, and exercise by focusing on the latest research. The chapter includes an overview of the two-factor model (or hierarchical model) of perfectionism and an updated review of research adopting an independent effects approach. In presenting our updated review we build directly on our previous efforts to review research in sport, dance, and exercise reported in Jowett, Mallinson, and Hill (2016). We highlight the current state of knowledge in this area, consider whether perfectionism is something to be encouraged or avoided based on research in sport, dance, and exercise, and make suggestions regarding directions for future research.

Two-Factor Model of Perfectionism

To provide a better understanding perfectionism and the findings of the reviews we describe later, we start with a brief overview of the two-factor model of perfectionism, also referred to as the hierarchical model of perfectionism. As in other domains, a number of different models and instruments have been used in sport, dance, and exercise to examine perfectionism, with those developed by Frost, Marten, Lahart, and Rosenblate (1990), Dunn and Gotwals (Dunn et al., 2006; Gotwals & Dunn, 2009), Hewitt and Flett (1991), and Stoeber, Otto, and Stoll (2006) the most popular. Because details of these models and instruments as they are used in sport, dance, and exercise have been provided elsewhere (Stoeber & Madigan, 2016), we do not repeat this information here and use the available space for novel content. Instead, we also provide a description of the two-factor model of perfectionism of which these individual models and instruments form a part. The two-factor model has been used previously to integrate and

organize lines of research adopting different models of perfectionism in sport, dance, and exercise (e.g., Gotwals, Stoeber, Dunn, & Stoll, 2012; Jowett, Mallinson, & Hill, 2016; Stoeber, 2011). We use it here in the same manner.

The two-factor model of perfectionism is comprised of two positively related higher-order dimensions of perfectionism, namely perfectionistic strivings (PS) and perfectionistic concerns (PC).[1] The dimensions are measured using subscales from the instruments developed by the researchers identified above. Current practice is to use subscales from the same instruments or multiple subscales from different instruments to capture the two dimensions. In sport, dance, and exercise, PS are most commonly measured using subscales capturing high personal standards, self-oriented perfectionism (imposing the need for perfection on the self), and striving for perfection. By contrast, PC are most commonly measured using subscales capturing concern over mistakes, negative reactions to imperfection, and socially prescribed perfectionism (believing others expect perfection). In summarizing the content of the higher-order dimensions of perfectionism, PS have been described as capturing "aspects of perfectionism associated with self-oriented striving for perfection and the setting of very high personal performance standards" and PC as capturing "aspects 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). Evidently, these are broad constructs conceived in a manner designed to encompass different models.

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[1]also referred to as personal standards perfectionism and evaluative concerns perfectionism (Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; see also Gaudreau & Thompson, 2010)

The two-factor model is based on factor-analytical studies that have examined the underlying structure of instruments designed to measure perfectionism (e.g., Bieling, Israeli, & Antony, 2004; Cox, Enns, & Clara, 2002; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). This research suggests that, regardless of the individual content, the two higher-order dimensions are represented in most instruments designed to measure perfectionism. Moreover, a two-factor model may even be a better representation of underlying structure than each instrument modelled separately (Bieling et al., 2004). The two-factor model is also based on evidence of "functional homogeneity" among its subdimensions (Gaudreau & Verner-Filion, 2012). That is, subdimensions indicative of PS or PC tend to have similar correlates and consequences. This can be observed in research in most domains including sport, dance, and exercise (see Jowett, Mallinson, & Hill, 2016). As such, the two-factor model is based on conceptual and empirical overlap evident between different perfectionism models and instruments of perfectionism and offers a useful heuristic when reviewing research.

Independent Effects Approach to Multidimensional Perfectionism

In the following part of the chapter, we summarize the findings of a previous review of research on perfectionism in sport, dance, and exercise before we present a review of the most recent research in these domains. Together, the reviews aim to illustrate the main findings in this area of research and should place the reader at the forefront of current understanding of perfectionism in these domains. In both these reviews, we adopted an "independent effects approach." We therefore start with a brief description of this approach.

One way of studying multidimensional perfectionism is to examine the effects of the two higher-order dimensions separately. The independent effects approach does so by examining the two dimensions in either an unpartialled or partialled manner. When examining the dimensions in an unpartialled manner, the two dimensions are simply examined separately. Both remain

conceptually and statistically unaltered. That is, no attempt is made to take into account or control for the relationship between them. This is the case when bivariate correlations are examined. By contrast, when examining the two dimensions in a partialled manner, the effects of one of the dimensions is examined when holding the effects of the other constant (i.e., the effects of PS on a criterion variable when PC is zero or another fixed value). In this case, the two dimensions of perfectionism are conceptually and statistically altered in that new residual variables are created whose relationship with any criterion variable is unique, that is, independent of the contribution of the other dimension of perfectionism. To reflect this fact, we have previously used the terms "pure PS" and "pure PC" when discussing these variables. However, so to avoid confusion with other uses of the term "pure" in this area (e.g., the 2 × 2 model of perfectionism), we use the terms "residual PS" and "residual PC" in this chapter.[2]

Adopting an independent effects approach allows examination of the unique (or independent) effects of PS and PC. This is advantageous because the two dimensions of perfectionism are typically positively related and often display opposing relationships with the same criterion variable. Therefore, it can be difficult to discern which dimension is responsible for a relationship with a given criterion variable, that is, to discern whether the relationship is unique to one particular dimension or whether it reflects common or shared variance. Comparison of bivariate correlations and partial correlations can also help identify instances of

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[2]The labels "pure PS" or "pure PC" can also be considered misleading in that they suggest that these variables are unrelated to each other (something we have stated in error when describing this approach previously; Jowett, Mallinson, & Hill, 2016). When fully controlled for, it is the residualized variable and the unresidualized opposite that are unrelated (e.g., residual PS and PC).

suppression whereby the two dimensions may act on each other so to increase or change the direction of their relationship with a given criterion variable. In some circumstances, suppression can pose interpretative difficulties but it can also add to our understanding of the relationship between predictor variables and criterion variable (Lynam, Hoyle, & Newman, 2006). For instance, comparison of PS, PC, and their residual counterparts can help identify the degree to which an observed relationship is attributable to the positive relationship between PS and PC. Therefore, the examination of partialled effects can be especially useful when studying multidimensional perfectionism.

Updated Review of Research Adopting an Independent Effects Approach

We recently reviewed research adopting an independent effects approach in sport, dance, and exercise (Jowett, Mallinson, & Hill, 2016). This review extended earlier reviews in sport, notably Stoeber's (2011) and Gotwals et al.'s (2012), in terms of coverage of sport research, as well as by including research in dance and exercise. In addition, whereas previous reviews included only criterion variables if they were clearly adaptive or maladaptive, and focused mainly on PS, we included all substantive criterion variables along with bivariate and partial correlations for both PS and PC. The review was based on an electronic search of PsycINFO, PsycARTICLES, and SPORTDiscus using the terms "perfection∗" (capturing all words containing "perfection" such as perfectionism, perfectionist, and perfectionistic) AND sport OR dance OR exercise, from January 1990 to August 2015, and included peer-reviewed journal articles published in English. In total, our review included 70 studies published between January 1991 and August 2015. This was 44 more studies and 1,736 additional bivariate and partial correlations than had previously been reviewed.

The findings of our review were similar to the two earlier reviews (Gotwals et al., 2012; Stoeber, 2011). In particular, PS displayed a mix of positive relationships with adaptive and

maladaptive criterion variables suggesting that PS are ambivalent in sport, dance, and exercise. This was evident in how PS was related to motivation (e.g., intrinsic *and* introjected regulation, harmonious *and* obsessive passion, task *and* ego orientation) and well-being (e.g., positive *and* negative affect, confidence *and* worry) in context of a positive relationship with performance (e.g., season's best performances, actual performances). By contrast, residual PS were not ambivalent (with a few exceptions detailed below). Most of the positive relationships with maladaptive criterion variables that characterized PS were diminished or reversed whereas the positive relationships with adaptive criterion variables were typically unaltered or strengthened when residual PS were examined. This was evident for motivation (e.g., task orientation, ego orientation, obsessive passion) and well-being (e.g., bulimia symptoms, social physique anxiety, need thwarting) as well as performance (e.g., season's best performances, actual performances). Two notable exceptions were exercise dependence and eating pathology with which PS and residual PS tended to be positively related. Across the criterion variables, the sizes of the relationships varied but medium to large-sized effects were common (based on r = .10, .30, and .50 being small, medium, and large sized effects; Cohen, 1992).

The review also revealed that PC displayed a consistent pattern of positive relationships with maladaptive criterion variables. This was evident for motivation (e.g., extrinsic regulation, ego orientation, fear of failure, amotivation) and well-being (e.g., worry, anxiety, low satisfaction). PC also displayed a pattern of negative relationships (or no relationships) with adaptive criterion variables. This included motivation (e.g., intrinsic regulation, identified regulation, and harmonious passion), well-being (e.g., friendship quality, task orientation, and self-esteem), and performance (e.g., season's best performances and actual performances). These relationships remained basically unaltered when residual PC were examined. However, there were some cases where residual PC were more maladaptive. This included instances where

statistically nonsignificant relationships with adaptive criterion variables became negative and statistically significant (e.g., friendship quality) and positive and statistically significant relationships with maladaptive criterion variables were strengthened (e.g., amotivation). Again, across the criterion variables, the sizes of the relationships varied but medium to large-sized effects were common.

Results of the review of research adopting an independent effects approach

For this chapter, a second electronic search was conducted using the same parameters as the previous review but searching over the time period since (August 2015 to May 2016; search carried out on April 17, 2016). The search produced 55 new studies. After reviewing the articles' abstracts for relevance (i.e., studies that provided empirical examination of perfectionism in sport, dance, or exercise), the number of studies was reduced to 12. One of these studies was a qualitative study (Hill, Witcher, Gotwals, & Leyland, 2015), and two studies examined unidimensional perfectionism (Tao & Sun, 2015; Watson Breeding & Anshel, 2015) which left us with nine studies (Barcza-Renner, Eklund, Morin, Habeeb, & Morin, 2016; Bennett, Rotherham, Hays, Olusoga, & Maynard, 2016; Cheng & Hardy, 2016; Costa, Coppolino, & Oliva, 2016; Hill, Robson, & Stamp, 2015; Neves, Meireles, Carvalho, Ameida, & Ferreira, 2016; Madigan, Stoeber, & Passfield, 2016a, in press-a; Oliveira et al., 2015). In addition, there were six published (or soon to be published) studies examining multidimensional perfectionism in sport, dance, and exercise that we were aware of but were not retrieved from the electronic search (Gustafsson, Hill, Stenling, & Wagnsson, in press; Jowett, Hill, Hall, & Curran, 2016; Lizmore, Dunn, & Causgrove-Dunn, 2016; Madigan, Stoeber, & Passfield, 2015, 2016b, in press-b) giving us a total of 15 studies. After excluding four further studies—three studies that did not report bivariate correlations (Barcza-Renner et al., 2016; Bennett et al., 2016; Oliveira et al., 2015) and one that reported correlations only for total perfectionism (Neves et al., 2016)—we

arrived at a final number of 11 studies examining multidimensional perfectionism in sport, dance, and exercise that were not included in the previous review (Jowett, Mallinson, & Hill, 2016). Table 1 shows the independent effects analyses for these 11 studies.

[Insert Table 1 about here.]

There are a number of notable observations from the present review. The first notable observation is the emergence of a number of longitudinal studies. (In the previous review, only 2 of 70 studies used longitudinal designs.) In two studies, Madigan et al. (2015, 2016b) examined the relationships between multidimensional perfectionism and athlete burnout (total burnout and individual burnout symptoms) in adolescent and adult athletes across two time points, three months apart. Madigan and colleagues found that PS were negatively related to total burnout at both time points and negatively related to reduced sense of accomplishment at Time 1, and exhaustion and devaluation at Time 2. Unexpectedly, PS were also positively related to reduced sense of accomplishment at Time 2. Residual PS negatively predicted changes in total burnout and two other symptoms, reduced sense of accomplishment and devaluation, over time. By contrast, PC were unrelated to total burnout and unrelated to reduced sense of accomplishment, exhaustion, and devaluation. Residual PC positively predicted changes in total burnout and one symptom, reduced sense of accomplishment, over time. Effect sizes over time tended to be small to medium-sized (e.g., PS–total burnout, PS–reduced sense of accomplishment, PS–devaluation, and PC–reduced sense of accomplishment). These findings provide an important extension to research in this area by confirming evidence from cross-sectional research and redressing null findings from the one previous study examining multidimensional perfectionism and athlete burnout longitudinally (Chen, Kee, & Tsai, 2009).

In another study, Madigan et al. (in press-b) supplemented their work on burnout by examining the related concept of training distress (a psychological precursor of overtraining

syndrome). Again, this study employed a longitudinal design to examine the relationship between multidimensional perfectionism and training distress and did so among adolescent athletes across two time points, three months apart. Madigan and colleagues found that PS were not related to training distress at either time point and that residual PS did not predict changes in training distress over time. However, PC were positively related to training distress at both time points, and residual PC positively predicted changes in training distress over time. The effect of PC on training distress over time was small- to medium-sized. When taken alongside the aforementioned research examining athlete burnout, we believe that a picture is beginning to emerge that suggests that PC and residual PC may be important in the progressive development of the inability to cope with, or adapt to, the psychological demands of sport participation.

The second notable observation is the continued interest of researchers in the influence of multidimensional perfectionism on exercise dependence. The possibility that dimensions of perfectionism are a risk factor for exercise dependence has long been of interest to our research group. Building on our previous work on this topic, a study by Hill, Robson, and Stamp (2015) examined the relationship between multidimensional perfectionism, perfectionistic self-presentation, and exercise dependence in adult exercisers. Hill and colleagues found that PS and residual PS were positively related to all symptoms of exercise dependence. In addition, PC were positively related to all but one symptom of exercise dependence (time spent in activities necessary for exercise) whereas residual PC were positively related to only two symptoms (giving up activities to engage in exercise and engaging in exercise in larger amounts than intended). Effects tended to be small to medium-sized. Based on these and previous findings (e.g., Miller & Mesagno, 2014), exercise dependence continues to be one of the few maladaptive criterion variables that PS and residual PS are consistently related to in research in this area. Examining exercise dependence further may therefore be particularly valuable in terms of

gaining a better understanding of what psychological costs are associated with PS and residual PS.

The third notable observation is the inclusion of examination of new criterion variables that are of interest and importance in the psychology of sport, dance, and exercise. Athlete engagement (the supposed antithesis of burnout), psychological need satisfaction (perceived lack of opportunities for need fulfilment), reasons for training, and training distress have all recently been examined for the first time. One particularly exciting development in this regards has been the publication of a study examining perfectionism and attitudes towards doping. In this study, Madigan et al. (2016a) found that residual PS (but not PS, PC, or residual PC) negatively predicted positive attitudes towards doping in a sample of adolescent athletes. The effect was small- to medium-sized. Doping continues to be a hot topic in sport, and the possibility that perfectionism may explain individual differences in attitudes towards doping and doping behavior is likely to be of significant interest to the wider field. We would therefore like to see additional research of this kind. This is also especially the case because Madigan et al.'s findings contradict other research that found both PS and PC to be positively related to positive attitudes towards doping in other athletic samples (e.g., Bahrami, Yousefi, Kaviani, & Ariapooran, 2014) and are counter to the notion that perfectionism may push athletes toward immoral behaviors that place themselves or others at risk of harm in pursuit of extremely high standards (Flett & Hewitt, 2014).

The fourth notable observation is that recent research has also extended our understanding of possible mediating mechanisms that might explain some of the relationships displayed by multidimensional perfectionism. Jowett, Hill, et al. (2016) provided evidence that the link between dimensions of perfectionism with both athlete burnout and athlete engagement may be mediated by perceptions of psychological need satisfaction and need thwarting

(perceptions of active obstruction to need fulfilment). In a sample of adolescent athletes, Jowett and colleagues found that residual PS were negatively related to total burnout via a positive relationship with need satisfaction and a negative relationship with need thwarting, and positively related to athlete engagement via a positive relationship with need satisfaction. By contrast, residual PC were positively related to total burnout via a negative relationship with need satisfaction and a positive relationship with need thwarting, and negatively related to athlete engagement via a negative relationship with need satisfaction (but not via need thwarting).

Interestingly, Costa et al. (2016) found similar support for the mediating role of need thwarting when examining perfectionism and exercise dependence. In a sample of adult exercisers, PC were found to be positively related to exercise dependence via a positive relationship with need thwarting (but not via any relationship with need satisfaction). We have previously argued that perfectionism (PC, in particular) may impoverish the fulfilment of psychological needs and contribute to a range of difficulties (see Mallinson & Hill, 2011). Exercise dependence and burnout are two examples of these difficulties. We believe that other difficulties associated with lower need fulfillment such as anti-social behavior and sport drop-out also warrant examination. The relationship between perfectionism and lower need fulfilment appears to be a key component in understanding why PC are likely to have a detrimental impact on the motivation and well-being of athletes, dancers, and exercisers. We encourage researchers to consider testing these assertions in future work.

The final notable observation is that studies are beginning to test more complex models that include moderating situational or contextual factors alongside perfectionism and various criterion variables. Gustafsson et al. (in press), for example, extended the work on perfectionism and athlete burnout by also examining the influence of perceptions of the parental climate (expectations evident in the behavior of parents that shape personal perspectives on success) in

adolescent athletes. They found that the adolescent athletes at greatest risk of burnout were those higher in both PS and PC who also perceived their parents to emphasize concerns about failure and winning without trying one's best. Also of note from this study is that it is the first time, to our knowledge, that PS has been found to have a positive statistically significant relationship with burnout symptoms. Specifically, PS displayed a positive small to medium-sized relationship with all three burnout symptoms. It is not clear why this was the case in this particular study. However, alongside research that has found PS to be unrelated and negatively related to burnout symptoms, this finding can be taken as evidence that the relationship between PS and burnout is subject to moderation by other factors. These factors will need to be identified in future research.

Another study that examined perfectionism and moderating factors has been provided by Lizmore et al. (2016). In their study they integrated perceptions of event criticality into an examination of the relationship between perfectionism and reactions to mistakes in a sample of adult curlers. They found that that PS and PC displayed relatively consistent relationships with anger/dejection and self-confidence/optimism across low and high critical events. Specifically, they found PS to be positively related to anger/dejection in both conditions of low and high criticality and positively related to self-confidence/optimism in conditions of low criticality. By contrast, PC was positively related to anger/criticality, and negatively related to self-confidence/optimism, in both conditions of low and high criticality. Effects were small-sized for PS and small- to medium-sized and large-sized for PC. Even though no evidence of moderation was found, this study and the study by Gustafsson et al. (in press) are extremely valuable as they among the few that have attempted to understand *when* PS and PC are likely to be beneficial or problematic for athletes, dancers, and exercisers, not just *if*. This is surely a more realistic and reasonable line of enquiry for future research than assuming that dimensions of perfectionism will be beneficial or problematic for all individuals all of the time.

Overall, the findings of the present review are consistent with the findings of our previous review of perfectionism in sport, dance, and exercise (Jowett, Mallinson, & Hill, 2016). Research continues to find PC and residual PC to exhibit a pattern of relationships with maladaptive criterion variables that suggests they are undesirable and debilitating. By contrast, PS continues to be more complex and ambivalent showing positive relationship with both adaptive and maladaptive criterion variables whereas residual PS continues to exhibit a pattern of relationships with adaptive and maladaptive criterion variables suggesting that residual PS are benign, or even beneficial (with exercise dependence being a notable exception).

Recommendations for Future Research

We close the chapter by directing attention to a number of additional issues that we believe need to be addressed in future research. The first issue is an over-reliance on cross-sectional designs. Most research to date on perfectionism in sport, dance, and exercise has adopted cross-sectional designs. The weaknesses of cross-sectional designs are well-documented. In particular, cross-sectional designs do not allow inference of causality between variables as there is no temporal component in the design (i.e., all variables are measured at the same time point). These designs provide only a static "snapshot" of the relationships they examine. They offer no means of assessing whether the magnitude or direction of the relationships change over time, or whether variables act on one another to varying degrees over time (i.e., the existence of reciprocal effects). Consequently, we know a considerable amount regarding the relationship between perfectionism and various criterion variables, but little about whether these are causal relationships or in which direction this is the case. As identified earlier, studies are emerging that use longitudinal designs to address these issues, and their findings indicate that perfectionism can predict change in various criterion variables. However, more longitudinal studies are sorely needed.

The second issue is that too few studies have employed designs examining factors that moderate the relationship of PS and PC with outcomes in sport, dance, and exercise. The reasons for this are unclear. One reason may be that researchers examine moderation effects, but only report them when they are statistically significant ($p < .05$). Another reason may be that interactions—signifying moderation effects—are difficult to detect in correlational research, and statistical analyses require large sample sizes to have sufficient statistical power to detect these effects (e.g., McClelland & Judd, 1993). Studies examining sport, dance, and exercise, however, often do not have large samples comprising several hundred participants. Still, research searching for moderators (and probing for interactions) is important because this research addresses whether there are situational or personal factors that provide resiliency towards the negative consequences of perfectionism. This research is also necessary in order to test important assertions that include the idea that those higher in perfectionism are vulnerable to psychological and motivational difficulties following achievement stress (the specific-vulnerability hypothesis) or may respond to difficult life circumstances in a fashion that is problematic (perfectionistic reactivity; Flett & Hewitt, 2016).

A third issue is the availability of quality instruments to measure perfectionism. As the area of research develops further, we must continue to develop and refine the instruments we use in sport, dance, and exercise to measure perfectionism. Outside of sport, dance, and exercise, researchers have been active in developing new measures and scrutinizing existing measures (e.g., Smith, Saklofske, Stoeber, & Sherry, 2016; Stoeber, in press). Although there have recently been similar developments in sport (e.g., Hill, Appleton, & Mallinson, 2016; Madigan, 2016), there is still considerable scope for more research of this kind. In particular, there are currently no instruments that have been developed specifically to measure perfectionism in dance or exercise, which may partly explain why perfectionism research in these two domains lags behind

perfectionism research in sport. Because perfectionism may be best measured using domain-specific instruments (e.g., Stoeber & Stoeber, 2009), the development of instruments designed to capture perfectionism as it is uniquely manifested in dance and exercise would be extremely valuable.

A final issue is the amount of research that has been dedicated to examining perfectionism in exercisers. In comparison to sport and dance, the correlates and consequences of perfectionism in exercisers have received much less attention. This is surprising because, anecdotally, perfectionism appears to be part of a culture common among some exercisers that includes a focus on "perfecting the body" (e.g., Morrison, Morrison, & Hopkins, 2003). Furthermore, the small number of studies that have examined perfectionism in an exercise domain indicates that perfectionism is related to the experiences of exercisers (e.g., Longbottom, Grove, & Dimmock, 2012). Exercise is also a particularly interesting domain in that dimensions of perfectionism that are sometimes associated with adaptive criterion variables (i.e., PS and residual PS) are often associated with maladaptive criterion variables in this domain (e.g., exercise dependence; Hill, Robson, & Stamp, 2015). For these reasons, we consider research examining perfectionism in exercise to be another priority for future research.

Concluding Comments

In this chapter we illustrated the correlates and consequences of perfectionism in sport, dance, and exercise by providing an updated review of research. Examination of multidimensional perfectionism continues to illustrate the unique (and often opposing) effects of PS and PC. Notably, this includes recent longitudinal work that suggests that perfectionism can predict changes in the experiences of athletes over time. Research has also begun to examine mediating and moderating factors. All this research is important because whether perfectionism is desirable or debilitating will depend on the degree to which a particular dimension is

exhibited, whether the other dimension of perfectionism is considered, and what other individual differences and contextual factors are evident. Based on current research, most guises of perfectionism are associated with some psychological costs to motivation and well-being. Only when the correlates and consequences of PS are considered independently from PC is this not the case (i.e., residual PS). To progress our understanding of perfectionism further, a number of recommendations were made for future research including a call for further studies employing longitudinal designs, a focus on moderating factors, the continued development and refinement of instruments to measure perfectionism, and more research on the influence of perfectionism among exercisers.

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Table 1

An Updated Review of Research Adopting an Independent Effects Approach to Perfectionism in Sport, Dance, and Exercise (August 2015 – May 2016)

				Perfectionistic				PS	PC	PS	PC
Study	Sample	Domain	Measure	Strivings (PS)	Concerns (PC)	$r_{PS, PC}$	Criterion variable	*r*	*r*	*pr*	*pr*
Cheng & Hardy (2016)	485 university dance students (87% females)	Dance	FMPS, SMPS, SMPS-2	PStan	CM	–	Cognitive anxiety	–	–	–	–
							Physiological anxiety	–	–	–	–
							Regulatory anxiety	**.51**	–	–	–
Costa et al. (2016)	169 adult exercisers (50% females)	Exercise	FMPS	–	CoPC	–	Autonomy thwarting	**.30**	–	–	–
							Competence thwarting	**.42**	–	–	–
							Relatedness thwarting	**.47**	–	–	–
							Autonomy satisfaction	**–.17**	–	–	–
							Competence satisfaction	–.14	–	–	–
							Relatedness satisfaction	–.15	–	–	–
							Need thwarting	**.47**	–	–	–
							Need satisfaction	**–.17**	–	–	–
							ED: Withdrawal	**.28**	–	–	–
							ED: Continuance	**.20**	–	–	–
							ED: Tolerance	**.18**	–	–	–
							ED: Lack of control	**.27**	–	–	–

							ED: Reduction in other activities	**.28**	–	–	–
							ED: Time	.06	–	–	–
							ED: Intention effects	**.16**	–	–	–
							ED: Total	**.29**	–	–	–
Gustafsson et al. (in press)	237 adolescent athletes (48% females)	Sport	FMPS SF	PStan	CM	**.68**	Learning/enjoyment climate	.10	**–.14**	**.26**	**–.28**
							Worry conducive climate	**.27**	**.46**	–.05	**.36**
							Success without effort climate	.12	**.18**	.00	**.13**
							BO: Reduced accomplishment	**.29**	**.48**	–.04	**.37**
							BO: Exhaustion	**.31**	**.49**	–.03	**.36**
							BO: Devaluation	**.23**	**.45**	–.09	**.39**
Hill, Robson, & Stamp (2015)	248 adult exercisers (41% females)	Exercise	HF-MPS SF	SOP	SPP	**.38**	Perfectionistic self-promotion	**.45**	**.57**	**.21**	**.39**
							Nondisplay of imperfection	**.29**	**.47**	.11	**.37**
							Nondisclosure of imperfection	**.32**	**.45**	**.14**	**.34**
							ED: Withdrawal	**.30**	**.22**	**.23**	.11
							ED: Continuance	**.23**	**.19**	**.17**	.11
							ED: Tolerance	**.30**	**.18**	**.25**	.07
							ED: Lack of control	**.29**	**.20**	**.23**	.09
							ED: Reduction	**.24**	**.21**	**.17**	**.13**
							ED: Time	**.26**	**.**10	**.24**	.00
							ED: Intention effects	**.29**	**.22**	**.22**	.11
Jowett, Hill, et al. (in press)	222 adolescent athletes (56% females)	Sport	HF-MPS SF, SMPS-2	CoPS	CoPC	**.22**	Need satisfaction	**.44**	–.07	**.47**	**–.15**

							Need thwarting	**–.16**	**.42**	**–.23**	**.46**
							Total engagement	**.41**	–.07	**.44**	**–.15**
							BO: Total	**–.26**	**.36**	**–.32**	**.41**
Lizmore et al. (2016)	343 adult curlers (42% females)	Sport	SMPS-2	PStan	CM	**.35**	RM: Anger and dejection (low criticality)	**.15**	**.46**	–.01	**.43**
							RM: Self-confidence and optimism (low criticality)	**.12**	**–.26**	**.22**	**–.32**
							RM: Anger and dejection (high criticality)	**.14**	**.48**	–.03	**.46**
							RM: Self-confidence and optimism (high criticality)	.10	**–.28**	**.20**	**–.33**
Madigan et al. (2015)	103 adolescent athletes (20% females)	Sport	SMPS, MIPS	CoPS	CoPC	**.54**	BO: Total (Time 1)	**–.31**	.08	**–.42**	**.28**
							BO: Total (Time 2)	**–.40**	.14	**–.56**	**.39**
Madigan et al. (2016a)	130 adolescent athletes (100% males)	Sport	SMPS, MIPS	CoPS	CoPC	**.60**	Positive attitudes towards doping	–.08	.10	–.17	**.18**
Madigan et al. (2016b)	129 adult athletes (49% females)	Sport	SMPS, MIPS	CoPS	CoPC	**.78**	BO: Reduced accomplishment (Time 1)	**–.33**	–.08	**–.43**	**.27**
							BO: Exhaustion (Time 1)	–.13	.08	**–.31**	**.29**
							BO: Devaluation (Time 1)	–.32	–.07	**–.42**	**.27**
							BO: Total (Time 1)	**–.29**	–.02	**–.44**	**.32**
							BO: Reduced accomplishment (Time 2)	**.29**	–.02	**.49**	**–.37**
							BO: Exhaustion (Time 2)	**–.21**	–.02	**–.31**	**.22**
							BO: Devaluation (Time 2)	**.29**	–.02	**.49**	**–.38**
							BO: Total (Time 2)	**–.31**	–.05	**–.43**	**.29**

Madigan et al. (in press-a)	261 adolescent and adult athletes (26% females)	Sport	MIPS	SP	NRI	**.62**	Reasons for training: Avoidance of negative affect	**.20**	**.31**	.01	**.23**
							Reasons for training: Weight control	**.14**	**.28**	–.04	**.24**
							Reasons for training: Mood control	**.20**	**.14**	**.14**	.02
Madigan et al. (in press-b)	141 adolescent athletes (11% females)	Sport	SMPS, MIPS	CoPS	CoPC	**.54**	Training distress (Time 1)	–.07	**.24**	**–.23**	**.33**
							Training distress (Time 2)	.09	**.33**	–.10	**.33**

Note. FMPS = Frost Multidimensional Perfectionism Scale (Frost et al., 1990), FMPS SF = FMPS, short form (Cox et al., 2002), HF-MPS SF = Hewitt–Flett Multidimensional Perfectionism Scale, short form (Cox et al., 2002), SMPS = Sport Multidimensional Perfectionism Scale (Dunn et al., 2006), SMPS-2 = Sport Multidimensional Perfectionism Scale, Version 2 (Gotwals & Dunn, 2009), MIPS = Multidimensional Inventory of Perfectionism in Sport (Stoeber et al., 2006); PStan = Personal Standards, CoPS = a composite of multiple subscales indicative of PS, SOP = Self-Oriented Perfectionism, SP = Striving for Perfection; CM = Concern over Mistakes, CoPC = a composite of multiple subscales indicative of PC, SPP = Socially Prescribed Perfectionism, NRI = Negative Reactions to Imperfection; ED = exercise dependence, BO = burnout, RM = reactions to mistakes; *r* = bivariate correlation, *pr* = partial correlation; Significant correlations ($p < .05$) are boldfaced.