



Male Body Image Related Pathology: The Requirement for Sub-Categorical and Dimensional Classification

MARK SUFFOLK



Empirical research highlights the increasing prevalence of males suffering from psychological difficulties as a result of body image dissatisfaction. Currently, the diagnostic classification system for extreme male body image concerns utilises an all-encompassing categorical approach. This theoretical article proposes that male body image concerns are heterogeneous, and what may appear to be body image concerns could be the result of contextual factors (e.g., competitive bodybuilders). Therefore, this article further proposes that a sub-categorical and dimensional classification system may yield the best research and clinical results.

Key Words: Male body image, Masculinity, Competitive bodybuilding, Pathology, Muscle dysmor-

phia.

Body image is defined as the inner representation of one's outer physical appearance (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Historically, body image disturbance has been considered a female concern (e.g., Humphreys & Paxton, 2004). However, a growing body of research supports the notion that males are becoming increasingly dissatisfied with their physique (e.g., Garner, 1997; Grogan & Richards, 2002; Lorenzen, Grieve, & Thomas, 2004). These concerns are predominantly characterised by a perceived lack of muscularity (Frederick et al., 2007; Pope, Philips, & Olivardia, 2000; Olivardia, 2001).

Alongside the escalation of male body image concerns, psychologists and psychiatrists are describing a male dominated body image pathology termed muscle dysmorphia (MD; e.g., Pope, Gruber, Choi, Olivardia, & Phillips, 1997). Development and maintenance of the disorder is an amalgam of distorted perceptual and cognitive encoding, and negative affect that undermines a positive body image (e.g., Pope et al., 1997). Muscle dysmorphia sufferers perceive themselves to be less muscular than they are in reality, and engage in pathological ritualistic behaviours in an attempt to resolve the psychological dissociation (e.g., Grieve, 2007). Heightened levels of anxiety and clinically significant impairment to psychosocial functioning are salient features of the MD profile (e.g., Grieve, 2007).

Presently, on-going debate surrounds the nosological status of this disorder. In order to provide a taxonomy for clinical reference, researchers offer support for the notion that MD is situated within either the spectrum of eating disorders (e.g., Grieve, Truba, & Bowersox, 2009; Mosley, 2008; Murray, Maguire, Russell, & Touyz, 2011), or obsessive-compulsive disorders (Maida & Armstrong, 2005), or represents a sub-type of body dysmorphic disorder (BDD; Pope et al., 1997). Despite the contention, MD is included in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) as a subtype of BDD due to the similarities in phenomenology between MD and BDD. However, scientists have yet to provide empirical evidence that MD is representative of a coherent clinical disorder, and warrants inclusion in the disease classification system (Nieuwoudt, Zhou, Coutts, & Booker, 2012).

Currently, the proposed criteria for MD are based on a categorical model (see Pope et al., 1997). However, as yet, no clear boundaries exist between 'normal' and 'abnormal' functioning which is problematic for dichotomous classification. This may be a consequence of attempts to explicate the phenomenology of MD often being conflated with sport or hobbies, where the acquisition of muscle tissue represents a functional contextual necessity (i.e., bodybuilding, power sports), dissatisfaction with physique as a result of excess subcutaneous fat, and positive deviance (Ben-Yehuda, 1990).

This theoretical article provides a brief account of the modern cultural values considered to underpin the intensification of male body image concerns. Thereafter, describes different sub-categories, specifically, competitive bodybuilders, positive deviance in sport, and males whose primary preoccupation is to reduce body fat levels, as opposed to increasing muscle size per se. The latter,

referred to here as *égnoiachondros* taken from the Greek words *égnouia* meaning preoccupation and *chondros* meaning fat. Finally, suggests that a dimensional architecture for classification of male body image related pathologies may yield the best clinical and research results. The dimension/sub-category issue is important as it allows the comparability of different sub-groups, and for the assessment of clinical distinctiveness relative to the population under investigation.

Muscularity Equates to Masculinity

Gender refers to the socially constructed roles assigned to males and females that define how men and women should think, act and feel. However, these culturally defined roles have contextual fluidity and are malleable in response to social, economic and political changes. Unlike sex, which is the biological distinction between males and females, gender refers to social expectations that distinguish between masculinity and femininity.

In contemporary Western culture, a muscular mesomorphology is highly emphasised as a desirable 'asset' and has become a symbol of our times to signify masculinity (Cortese, 2007). The masculine stereotype links a muscular physique to efficacy, control, and potency (Mishkind, Rodin, Silberstein, & Striegel-Moore, 1986). The omnipresence of a hyper-muscular 'body ideal' in the mass media is implicated in creating a pathoplastic effect (Agliata & Tantleff-Dunn, 2004), and linked to males becoming dissatisfied with their levels of muscularity (Tiggemann & Slater, 2004).

Given the increase in females social and economic power (Cortese, 2007), social commentators frequently posit the view, that the increased drive among males to achieve a distinctive icon of masculinity, represents 'gender insecurity' (e.g., Klein, 1993) and a turn to hegemonic masculinity (Connell, 1995). Whilst it is important to recognise, that hegemonic masculinity and gender construction is a complex collective web of influences (Berger, Wallis, & Watson, 1995), the body represents a powerful site of social communication (Brown, 1999). Biology may not determine the social (Stibbe, 2004), but males attach power and privilege to biological differences (Klein, 1993) in order to assert power over females. The attainment of a muscular physique has social significance and is related to biological factors. Consequently, the body represents a visually salient symbol to authenticate male superiority (Connell, 1995). A precipitating factor in the pathogenesis of body dissatisfaction, particularly MD, is the result of over-conforming to gender role norms of masculinity ideology (Cortese, 2007; Pope et al., 2000). The ensuing malaise characterises a debilitating dysfunction of gender construction in modern Western culture (Cortese, 2007).

However, despite the range of etiological perspectives and conceptual models of body image disturbance (e.g., Grieve, 2007; Rhea, Lantz, & Trail, 2000), for clinical and research purposes it is important to recognise divergent motivational and contextual factors in relation to male body image.

Positive Deviance in Sport and Muscle Dysmorphia Criteria

The psychobehavioural determinants of MD were identified during investigations into the bodybuilding community (Pope et al., 1997; Pope, Katz, & Hudson, 1993). Bodybuilding is considered a subculture of hyperbole (Klein, 1993). The protagonists develop and display, hyper-mesomorphic

physiques resembling 'comic book' masculinity (Klein, 2007), that seemingly epitomises the outward expression of MD. As a result, investigations into MD have largely focussed on this cohort (e.g., Babusa & Túry, 2012; Behar & Molinari, 2010; Baghurst & Lirgg, 2009; Cella, Iannaccone, & Cotrufo, 2012; Connan, 1998; Hitzeroth, Wessels, Zungu-Dirwayi, Oosthuizen, & Stein, 2001; Jankauskiene, Kardelis, & Pajaujiene, 2007; Lantz, Rhea, & Cornelius, 2002; Mosley, 2009; Olivardia, Pope, & Hudson, 2000; Pope et al., 1993; Pope et al., 1997; Wolke & Sapouna, 2008).

Competitive bodybuilding, is often considered at best a marginal sport (Holm, 2000), or an 'oddball' sport (Boyle, 2010). At worst, a public display of institutionalised narcissism (1993) rejected for its homoerotic imagery (Boyle, 2010). According to Klein (1993), the social-psychological construction of a bodybuilder is a fusion of narcissism, homophobia, hypermasculinity, and fascism. However, bodybuilders operate in a unique competitive environment where competitive success is dependent on a combination of muscle size and definition (Lambert, Frank, & Evans, 2004). According to Chung (2001) researchers have frequently neglected to acknowledge that the primary motivation of competitive bodybuilders is to be bigger, and display more muscularity than the other competitors. For those who are successful, the competitive bodybuilding subculture offers individuals an opportunity to profit from an activity which has developed worldwide into a multi-billion dollar industry (Prokop & Neveux, 1994). The opportunity to attract lucrative sponsorship deals, or enhance reputations as personal trainers keeps many individuals in the gym (Kimmel & Aronson, 2004).

Importantly, the job of psychological science is to understand and explain human behaviour, not to automatically pathologise behaviours which seem at odds with the notion of 'normality'. Consequently, it may be instructive from a clinical and research perspective to situate competitive bodybuilding within the context of competitive sport.

Conceptually, positive deviance is broad. However, sociologists and social analysts are discussing positive deviance within competitive sport (e.g., Blackshaw & Crabbe, 2004). In effect, positive deviance is not the rejection of conventional norms, but results from an athlete uncritically accepting, and over-conforming to the sporting ethic (Milner, Melnick, Barnes, Sabo, & Farrell, 2007). Sport emphasises positive norms at both micro and macro levels, in the form of personal growth, social integration, and social change (Wankel & Berger, 1990). However, the sporting ethic of 'win at all costs' allows behaviours that may be conventional in motivation, to become deviant in nature as they may be conducted with an unhealthy level of intensity (Hughes & Coakley, 1991). Applying a 'positive deviance in sport' framework to the proposed diagnostic criteria for MD (see Pope et al., 1997) by replacing a preoccupation with building muscle, with a preoccupation for sprinting or swimming faster, reveals similarities between MD and the psychobehavioural concomitants considered indicative of positive deviance in mainstream sport.

The use of appearance and performance enhancing drugs is an example of deviance (Hughes & Coakley, 1991), and usage is reported to be widespread in mainstream sport (e.g., Beckett & Cowan, 1979; Cornelius, 1995). Furthermore, the culture of competitive sport delivers the message that participants should accept risks, and that training through pain and injury is part of striving for distinction (Nixon, 1993). One other area of deviance relating to the sporting ethic, is the notion that one must sub-ordinate other interests to fully commit to the sport, and make sacrifices to do what

is necessary to compete successfully (Hughes & Coakley, 1991). Reports suggest that, athletes are prepared to pay significant costs in striving for peak performance, for example, sacrifice health and education (Krumer, Shavet, & Rosenboim, 2011). Moreover, competitive sport participation is associated with maladaptive social behaviour (Pappas, McKenry, & Catlett, 2004), and a greater vulnerability and incidence of anxiety and depression (e.g., Brewer, Van Raatle, & Linder, 1993). In brief, significant elements of the proposed psychobehavioural indicators of MD are analysed through a positive deviance lens in sporting sociological analysis, without the necessity to establish a distinct pathological clinical entity.

The reason why the attitudes and behaviours of the bodybuilding community are viewed as representative of clinical distinctiveness may be due to the negative connotations associated with bodybuilders, and bodybuilding as a competitive activity (e.g., Grogan & Richards, 2002; Klein, 1993; Persson, 2004; Sheldon, 1940). Moreover, according to Pope (2005), many clinicians and members of the general populace hold the belief that bodybuilding is inherently pathological, and that those who participate represent a homogenous group with a similar identity (Probert, Leberman, & Palmer, 2007). In contrast, the behaviours, psychological characteristics, and personality traits of successful athletes in mainstream sporting endeavours are positively reinforced by the media and supporters, and become the standard for judging a serious athlete (Hughes & Coakley, 1991).

Evidence suggests that those who currently, and aspire to compete in bodybuilding, are not the best population to study in order to unravel the complexities of MD etiology and maintenance. The indications are that, bodybuilders utilise nutritional and training periodisation based around competitive schedules (Anderson, Bartlett, Morgan, & Brownell, 1995; Jankauskiene et al., 2007; Manore, Thompson, & Russo, 1993; Monaghan, 2001; Newton, Hunter, Bammon, & Roney, 1993; Suffolk, Dovey, Goodwin, & Meyer, in press). This mirrors the approach reported in mainstream sports (Fleck, 1999; McNeely, Sandler, & Bamel, 2005; Smith, 2006; Stellingwerff, 2012). Transient behaviours relating to muscle building that vary in intensity, are incongruent with the proposal that MD represents an intense temporally stable preoccupation with muscle building activities.

One unique feature of the MD profile not discussed with the literature covering positive deviance in sport, relates to the term 'physique protection'. Typically, this describes the reluctance of an individual to expose their physique to others (Pope et al., 1997). However, the concept of physique protection further discriminates competitive bodybuilding from MD. In a seminal paper defining MD, according to Pope et al., (1997) a sufferer of muscle dysmorphia can only compete in a bodybuilding event after weeks of intense preparation. Explicit in the above statement by Pope et al., is the reference to competitive bodybuilders and the preparatory competition behaviours. However, implicitly stated is opposition to the proposed diagnostic criteria, as MD is characterised by continued obsession with the body (Olivardia, et al., 2000), and not just weeks of intense preparation.

Primary Preoccupation with Body Fat

Social comparisons serve as a means to gather information regarding valuable attributes and cultural norms (Wood, 1989); consequently, individuals frequently make cognitive judgments about their own attributes in comparison to others (Jones, 2001). The increased salience in the objectification of a muscular male in the mass media (Fawkner & McMurray, 2002; Leit, Pope, & Gray, 2001; Schooler

& Ward, 2006), transmitting messages that muscularity equates to masculinity (Helgeson, 1994) is linked to males becoming dissatisfied with their body image (Tiggemann & Slater, 2004). Making upward social comparisons to those we perceive to have desirable physical attributes can create a negative contrast effect due to a discrepancy between body reality and body ideal. Psychoemotional disturbance may develop due to the personal and social implications attached to that discrepancy (Martin & Govender, 2011).

Body image researchers have suggested that male physique anxiety relates to levels of subcutaneous body fat, as oppose to lack of muscle size per se (Baghurst, 2012). According to the World Health Organisation, epidemiological data highlights that in 2008, 1.5 billion adults worldwide aged 20 and older were overweight. Of these, over 200 million men were classified as obese. Concurrently, across studies, between 51-71% of men report dissatisfaction with their level of body fat (Frederick et al., 2007), and 16% report that they avoid wearing a bathing suit in public (Frederick, Peplau, & Lever, 2006).

Reports indicate that, males feel under pressure to attain a physique described as lean and athletic (e.g., Frederick et al., 2007), or slender and lean (Grogan & Richards, 2002). The physical ideology of contemporary Western culture is characterised by wide shoulders and a set of 'six-pack abs' (Pope et al., 2000). Theoretically, the overarching prized physical asset among males is a 'six pack'. Google AdWords reveals that the phrase 'How to get abs' is globally searched on-line, on average, 11,100,000 times per month, opposed to 'how to get bigger legs' (14,800), 'bigger back' (2,400), and 'muscular shoulders' (6,600; 2nd April, 2013). In addition, there is a proliferation of books in the marketplace with titles such as "Abs for life", "How to get a six-pack fast" and "Burn belly fat and develop a six pack". Moreover, there is an increase in fitness classes specifically aimed at developing the abdominal muscles. For example, ABSolution classes which promise the participant will quickly gain a 'toned' mid-section. Clearly, the above is not representative of exact science, but highlights an emergent trend, that to possess muscular and defined abdominal muscles is of primary importance.

Empirical evidence suggests the current trend among males is not the attainment of the 'exaggerated' mesomorphic physique resembling the aesthetic form of comic book masculinity (Klein, 2007). This degree of muscular hypertrophy is viewed as non-functional and aesthetically displeasing, and those who attain this level of muscularity are believed to be obsessive and narcissistic (Klein, 1993). Consequently, the male preference is for toned, healthy, and athletic (Grogan & Richards, 2002; Labre, 2005). Male fitness trainers have been found to desire a lean and defined body rather than a hyper-mesomorphic physique, and exhibit a preoccupation with low levels of body fat (Philips & Drummond, 2001). In addition, research underpinned by social comparison theory found that viewing muscular imagery (i.e., athletic and toned) increased body dissatisfaction, whereas, viewing hyper-mesomorphic imagery (i.e., bodybuilding magazines) had no significant effect on physique dissatisfaction (Arbour & Martin Ginnis, 2006).

Reducing levels of subcutaneous body fat requires to the individual to ingest less calories than one expends (Leone, 2012). To display a 'six-pack' requires the removal of subcutaneous body fat so that the fascia of the muscle becomes apparent and visible to the eye, which occurs at approximately 5-6% body fat (Persson, 2004). In contrast, a clinically normal range for males is between

10-25% (Whitney & Rolfes, 1996).

Researchers have posited the view that conceptually MD represents an eating disorder (e.g., Murray et al., 2011). This is problematic if MD is considered to be a pathological obsession with increasing muscle size, as no temporally stable pattern of maladaptive nutritional strategies are reported outside of the context of bodybuilding competition. However, attempts to accomplish and continually maintain a physique with such a low body fat percentage can potentially provide a fertile ground for development of an eating disorder. To view male body image concerns as a primary preoccupation attaining a low body fat percentage provides a 'better fit' with the notion that the nosology of MD is within the spectrum of eating disorders. The final qualifier for the desired body composition balance between muscle and body-fat is that 'the percentage of body-fat that counts' (Philips & Drummond, 2001). Currently, an increasing amount of young male gym members of normal bodyweight are requesting weekly, or even twice weekly measurement of their body fat levels (Biddle, personal communication, March 24, 2013). In sum, a growing body of evidence supports the hypothesis that the overarching preoccupation among males relates to low body fat levels to increase muscular definition.

Conceptually, *égnoiachondros*, can be distinguished from well-established eating disorders (i.e., anorexia nervosa), where sufferers are preoccupied with bodyweight (e.g., Polivy & Herman, 2002), as opposed to a preoccupation with body fat. Whilst the exercise regimes of anorexia nervosa and bulimia nervosa sufferers serve more than just to expend energy (Davis, Katzman, & Kirsh, 1999), the type of exercise performed is long bouts of aerobic activity (i.e., running) (Solenberger, 2001), whereas, an *égnoiachondriac*, theoretically, employs anaerobic activity (i.e., weight-training) to preserve muscle tissue. Specific research is required to ascertain if the goal of reducing body fat to potentially unhealthy levels is purely restrictive or has purging characteristics.

Future Diagnostic Consideration

Clearly, etiology and maintenance of male body image concerns is a complex blend of physical, cultural, and psychosocial factors. The original conceptualisation and clinical distinctiveness of MD, focussed on a pathological preoccupation to increase muscular size whilst simultaneously reducing body-fat levels. Potentially, the criteria need to be amended to account for contextual and sub-categorical qualities of male body image disturbance, and subsequent development of psychological difficulties. The psychobehavioural characteristics of those with a primary focus on increasing muscle mass, and those who predominantly desire to reduce body fat may form the basis of two distinct clinically relevant disorders. The former taken outside of a sporting context may be more representative of MD, whereas the latter may be considered as *égnoiachondros*. Taxometric analysis is required to determine if the current categorical model of classification is sufficient, or whether a sub-category/dimensional model would provide a more valid description of psychopathology in relation to male body image disturbance (see Widiger & Samuel, 2005). Table 1 shows a sub-categorical model in relation to male body image concerns. The sub-categories can be considered as differences in kind, whereas dimensions can be thought of as differences in degree (Meehl, 1992). It is argued here that, formulating a sub-categorical and dimensional nosology, opposed to the all-encompassing categorical approach is important conceptually, and not inconsistent with generating a typology. Male body image concerns are heterogeneous, and these sub-categories can be tested empirically.

In addition, a dimensional classification of these sub-categories can inform a graded treatment decision (Acton & Zodda, 2005).

In order to provide clinicians with a frame of reference to recognise valid signs and symptomatology, it is especially important that researchers distinguish between the divergent motivations of individuals who engage in exercise and nutritional regimes with the aim of 'physique enhancement'. This has clinical implications, if extreme and maladaptive behaviours of competitive individuals are a consequence of over-subscribing to the 'win at all costs' sporting ethic, then psychological intervention can aim to modify the behaviours. On a global level, greater awareness can provide psychoeducation and alert bodybuilding coaches and 'power sports' trainers to the potential health risks for clients who compete. In the non-competitive community if the pathological pursuit of a lean and athletic physique is a consequence of the modern cultural depiction of the 'ideal male', then therapists can aim to modify how the individual views themselves in relation to those images. Globally, this can allow for greater precision in respect to epidemiological data, and highlight the potential dangers of the mass media's predilection to utilise muscular male imagery for advertising purposes.

Table 1.
Sub-Categories of Male Body Image Concerns

Behaviour in context	Time span	Classification	Distinct conditions	End goal
Extreme muscle building activities within competitive sport.	Not TS ^a	PD ^b	Cyclical behaviours.	To win competition
Extreme muscle building behaviours within competitive sport.	TS	PD/MD	Continued behaviours no recuperation after competition. Behaviours may develop as a result of internalising poor performance as a lack of strength/ muscle.	To win competition
Main preoccupation with increasing muscle mass.	TS	MD ^c	Continued behaviours aimed at primarily increasing muscle size. Secondary, lowered percentage of body-fat	Exaggerated hyper-mesomorphic physique.
Main preoccupation with reduction of body fat.	TS	Egnoichondros	Continued behaviours aimed to primarily reduce percentage of body-fat.	Male fitness model. Athletic/lean physique.

^aTemporally Stable ^bPositive Deviance ^cMuscle Dysmorphia

References

- Acton, G.S., & Zodda, J.J. (2005). Classification of psychopathology: goals and methods in an empirical approach. *Theory Psychology*, 15(3), 373-399. doi: 10.1177/0959354305053220
- Agliata, D., & Tantleff-Dunn, S. (2004). The impact of media exposure on males' body image. *Journal of Social and Clinical Psychology*, 23(1), 7-22. doi: 10.1521/jscp.23.1.7.26988
- Anderson, R.E., Bartlett, S.J., Morgan, G.D., & Brownell, K.D. (1995). Weight loss, psychological, and nutritional patterns in competitive male bodybuilders. *International Journal of Eating Disorders*, 18(1), 49-57. doi: 10.1002/1098-108X (199507)18
- Arbour, K.P., & Martin Ginis, K. (2006). Effects of exposure of muscular and hyper muscular images on young men's muscularity dissatisfaction and body dissatisfaction. *Body Image*, 3(2), 153-162. doi:10.1016/j.bodyim.2006.03.004
- Babusa, B., & Túry, F. (2012). Muscle dysmorphia in Hungarian non-competitive male bodybuilders. *Eating and Weight Disorders*, 17(1), e 49-53.
- Baghurst, T. (2012). Muscle dysmorphia and male body image: A personal account. *New Male Studies*, 1(3), 125-130.
- Baghurst, T., & Lirgg, C. (2009). Characteristics of muscle dysmorphia in male football, weight training and competitive natural and non-natural bodybuilding samples. *Body Image*, 6, 221-227. doi:10.1016/j.bodyim.2009.03.002
- Beckett, A.H., & Cowan, D.A. (1979). Misuse of drugs in sport. *British Journal of Sports Medicine*, 2,185.
- Behar, R., & Molinari, R. (2010). Muscle dysmorphia, body image and eating behaviors in two male populations. *Revista Médica de Chile*, 138(11), 1386-94. doi: /S0034-988720100001200007
- Ben-Yehuda, N. (1990). Positive and negative deviance: More fuel for a controversy. *Deviant Behavior*, 11(3), 221-243. doi:10.1080/01639625.1990.9967846
- Berger, M., Wallis, B., & Watson, S. (Eds) (1995). *Constructing Masculinity*. Routledge: New York.
- Blackshaw, T., & Crabbe, T. (2004). *New Perspectives on Sport and 'Deviance': Consumption, Performativity, and Social Control*. Abingdon: Routledge.
- Boyle, E. (2010). Marketing muscular masculinity in Arnold: the education of a bodybuilder. *Journal of Gender Studies*, 19(2), 153- 166. doi: 10.1080/09589231003695872
- Brewer, B. W., Van Raatle, J. L., & Linder, D. E. (1993). Athletic identity: Hercules' muscles or Achilles heel. *International Journal of Sport Psychology*, 24, 237-254.

- Brown, D.H.K. (1999). Bodybuilders and the social meaning of muscle. *Auto/Biography*, 7(1&2), 83-90.
- Cella, S., Iannaccone, M., & Cotrufo, P. (2012). Muscle dysmorphia: A comparison between competitive bodybuilders and fitness practitioners. *Journal of Nutritional Therapeutics*, 1(1), 12-18. doi: 10.4331/wjbc.v3.i1.184
- Chung, B. (2001). Muscle Dysmorphia: A critical review of the proposed criteria. *Perspectives in Biology and Medicine*, 44(4), 565-574. doi:10.1353/pbm.2001.0062
- Connell, R.W. (1995). *Masculinities*, Allen & Unwin: Sydney.
- Connan, F. (1998). Machismo nervosa: An ominous variant of bulimia nervosa. *European Eating Disorders Review*, 6, 154-159.
- Cornelius, A. (1995). The relationship between athletic identity, peer and faculty socialization, and college student development. *Journal of College Student Development*, 36, 560-573.
- Cortese, A.J. (2007). *Provocateur: Images of Women and Minorities in Advertising* (3rd ed.). Lanham, Maryland: Rowman & Littlefield.
- Davis, C., Katzman, D.K., & Kirsh, C. (1999). Compulsive physical activity in adolescents with anorexia nervosa: a psychobehavioural spiral of pathology. *The Journal of Nervous and Mental Disease*, 187(6), 336-342.
- Fleck, S.J. (1999). Periodized strength training: A medical review. *Journal of Strength and Conditioning Research*, 13(1), 82-9.
- Frederick, D. A., Buchanan, G. M., Sadeghi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men and Masculinity*, 8, 103-117.
- Frederick, D.A., Peplau, L.A. & Lever, J. (2006). The swimsuit issue: Correlates of body image in a sample of 52,677 heterosexual adults. *Body Image*, 4, 413-419.
- Garner, D.M. (1997). The 1997 body image survey results. *Psychology Today*, 30(1), 30-48.
- Grieve, F. G. (2007). A conceptual model of factors contributing to the development of Muscle Dysmorphia. *Eating Disorders*, 15, 63-80. doi:10.1080/10640260601044535
- Grieve, F. G., Truba, N., & Bowersox, S. (2010). Etiology, assessment, and treatment of muscle dysmorphia. *Journal of Cognitive Psychotherapy*, 4, 309-315.
- Grogan, S., & Richards, H. (2002). Body Image: Focus groups with boys and men. *Men and Masculinities*, 4(3), 219-232.

- Helgeson, V. S. (1994). Prototypes and dimensions of masculinity and femininity. *Sex Roles*, 31, 653-682.
- Hitzeroth, V., Wessels, C., Zungu-Dirwayi, N., Oosthuizen, P., & Stein, D.J. (2001). Muscle dysmorphia: A South African sample. *Psychiatry and Clinical Neurosciences*, 55, 521-523.
- Holm, S. (2000). Changes to bodily appearance: the aesthetics of deliberate intervention. *Medical Humanities*, 26(1), 43-48. doi:10.1136/mh.26.1.43
- Hughes, R. & Coakley, J. (1991). Positive deviance among athletes: The implications of over conformity to the sport ethic. *Sociology of Sport Journal*, 8(4), 307-325.
- Humphreys, P., & Paxton, S. J. (2004). Impact of exposure to idealized male images of adolescent boys' body image. *Body Image*, 1, 253-266.
- Jankauskienė, R., Kardelis, K., & Pajaujienė, S. (2007). Muscle size satisfaction and predisposition for a health harmful practice in bodybuilders and recreational gymnasium users. *Medicina (Kaunas, Lithuania)*, 43(4), 338-46.
- Jones, D.C. (2001). Social comparison and body image: Attractiveness comparisons to models and peers among adolescent girls and boys. *Sex Roles*, 45(9/10), 645-664.
- Kimmel, M.S., & Aronson, A. (eds.) (2004). *Men & Masculinities: A Social, Cultural, and Historical Encyclopedia*. Santa Barbara, CA: ABC-CLIO.
- Klein, A. M. (1993). *Little big men: Bodybuilding subculture and gender construction*. Albany, N.Y.: State University of New York Press.
- Klein, A. M. (2007). Comic book masculinity. *Sport in Society*, 10(6), 1073-1119. doi:10.1136/mh.26.1.43
- Krumer, A., Shavit, T., & Rosenboim, M. (2011). Why do professional athletes have different time preferences than non-athletes? *Judgment and Decision Making*, 6(6), 542-551.
- Labre, M. P. (2005). Burn fat, build muscle: A content analysis of Men's Health and Men's Fitness. *International Journal of Men's Health*, 4(2), 187-200.
- Lambert, C. P., Frank, L. L. & Evans, W. J. (2004). Macronutrient considerations for the sport of bodybuilding. *Journal of Sports Medicine*, 34(5), 317-327.
- Lantz, C.D., Rhea, D.J., & Cornelius, A.E. (2002). Muscle dysmorphia in elite level power lifters and body builders: A test of differences within a conceptual model. *Journal of Strength and Conditioning Research*, 16, 649-655.
- Leit, R. A., Pope, H. G., & Gray, J. J. (2001). Cultural expectations of muscularity in men: The evolution of playgirl centerfolds. *International Journal of Eating Disorders*, 29, 90-93. doi:10.1002/1098-

108X(200101)29:1<90

- Leone, J.E. (2012). *Concepts in Male Health: Perspectives across the Lifespan*. Jossey-Bass/Wiley
- Lorenzen, L. A., Grieve, F. G., & Thomas, A. (2004). Exposure to muscular male models decreases men's body satisfaction. *Sex Roles*, 51, 743-748.
- Maida, D. M., & Armstrong, S. L. (2005). The classification of muscle dysmorphia. *International Journal of Men's Health*, 4, 73-91.
- Manore, M.M., Thompson, J., & Russo, M. (1993). Diet and exercise strategies of a world-class bodybuilder. *International Journal of Sport Nutrition*, 3(1), 76-86.
- Martin, J., & Govender, K. (2011). "Making Muscle Junkies": Investigating traditional masculine ideology, body image discrepancy, and the pursuit of muscularity in adolescent males. *International Journal of Men's Health*, 10(3), 220-239. doi: 10.3149/jmh.1003.220
- McNeely, E., Sandler, D., & Bamel, S. (2005). Strength and power goals for competitive rowers. *Strength and Conditioning Journal*, 27(3), 10-15.
- Meehl, P. E. (1992). Factors and taxa, traits and types, differences of degree and differences in kind. *Journal of Personality*, 60, 117-174.
- Miller, K. E., Melnick, M. J., Barnes, G. M., Sabo, D. F., & Farrell, M. P. (2007). Athletic involvement and adolescent delinquency. *Journal of Youth & Adolescence*, 36, 711-723. doi: 10.1007/s10964-006-9123-9
- Mishkind, M.C., Rodin, J., Silberstein, L.R., & Striegel-Moore, R.H. (1986). The embodiment of masculinity: Cultural, psychological and behavioral dimensions, *American Behavioral Scientist*, 29(5), 545-562.
- Monaghan, L. F. (2001). *Bodybuilding drugs and risk*. Routledge: London.
- Mosley, P.E. (2009). Bigorexia: bodybuilding and muscle dysmorphia. *European Eating Disorders Review*, 17(3), 191-198. doi:10.1002/erv.897
- Murray, S.B., Rieger, E., & Touyz, S.W. (2011). Muscle dysmorphia symptomatology during a period of religious fasting: A case report. *European Eating Disorders Review*, 19(2), 162-168.
- Newton, L.E., Hunter, G., Bammon, M., Roney, R. (1993). Changes in psychological state and self-reported diet during various phases of training in competitive bodybuilders. *Journal of Strength and Conditioning Research*, 7(3), 153-158.
- Nieuwoudt, J.E., Shi Zhou, S., Coutts, R.A., & Booker, R. (2012). Muscle dysmorphia: Current research and potential classification as a disorder. *Psychology of Sport and Exercise*, 13, 569-577.

doi:10.1016/j.psychsport.2012.03.006

- Nixon, H. L. (1993). Accepting the risks of pain and injury in sport: Mediated cultural influences on playing hurt. *Sociology of Sport Journal*, 10, 183-196.
- Olivardia, R. (2001). Mirror, mirror on the wall, who's the largest of them all? The features and phenomenology of muscle dysmorphia. *Harvard Review of Psychiatry*, 9, 254-259.
- Pappas, N. T., McKenry, P. C., & Catlett, B. (2004). Athlete aggression on the rink and off the ice: athlete violence and aggression in hockey and interpersonal relationships. *Men and Masculinities*, 6(3), 291-312.
- Persson, R. S. (2004). Big, bad and stupid or big, good and smart: A three year participant observational field study of the male bodybuilder stereotype and its consequences. Sweden: Jönköping University Press.
- Philips, J.M., & Drummond, M.J.N. (2001). An investigation into the body image perception, body satisfaction and expectations of male fitness leaders: Implications for professional practice, *Leisure Studies*, 20(2), 95-105. doi:10.1080/02614360010025506
- Polivy, J., & Herman, C. P. (2002). Causes of eating disorders. *Annual Review of Psychology*, 53, 187-213.
- Pope, H. G. (2005). Commentary in, Pickett, T.C., Lewis, R.J., & Cash, T.F. (2005). Men, muscles, and body image: comparisons of competitive bodybuilders, weight trainers, and athletically active controls. *British Journal of Sports Medicine*, 39, 217-222. doi:10.1136/bjism.2004.012013
- Pope, H. G., Gruber, A., Choi, P., Olivardia, R., & Phillips, K. (1997). Muscle dysmorphia: An under-recognized form of body dysmorphic disorder. *Psychosomatics*, 38, 548-557.
- Pope, H. G., Katz, D., & Hudson, J. (1993). Anorexia nervosa and "reverse anorexia" among 108 bodybuilders. *Journal of Comprehensive Psychiatry*, 34, 406-409.
- Pope, H. G., Phillips, K. A., & Olivardia, R. (2000). *The Adonis Complex: the secret crisis of male body image*. New York: The Free Press.
- Probert, A., Leberman, S., & Palmer, F. (2007). New Zealand bodybuilder identities: Beyond homogeneity. *International Review for the Sociology of Sport*, 42, 5.
- Prokop, D., & Neveux, M. (1994). *The Art of Muscle*. London: Bison.
- Rhea, D. J., Lantz, C., & Trail, G. T. (2000). *Muscle dysmorphia: A confirmatory test of a new model*. AAHPERD National Convention. Orlando, Florida.
- Schooler, D., & Ward, L. M. (2006). Average Joes: Men's relationships with media, real bodies, and sexuality. *Psychology of Men and Masculinity*, 7, 27-41.

- Sheldon, W.H. (1940). *The Varieties of Human Physique*. Harper and Brothers: New York, NY.
- Smith, M. S. (2006). Physiological profile of senior and junior England international amateur boxers. *Journal of Sports Science and Medicine*, 5(CSSI), 74–89.
- Solenberger, S.E. (2001) Exercise and the eating disorders: A 3 year inpatient hospital records analysis. *Eating Behaviours*, 2, 151-168.
- Stellingwerff, T. (2012). Case study: Nutrition and training periodization in three elite marathon runners. *International Journal of Sport Nutrition and Exercise Metabolism*, 22(5), 392-400.
- Stibbe, A. (2004). Health and the social construction of masculinity in Men's Health magazine. *Men and Masculinities*, 7(1), 31–51. doi: 10.1177/1097184X03257441
- Thompson, J. K., Heinberg, L.J., Altabe, M.N., & L.J., Altabe, M.N., & Tantleff-Dunn, S. (1999). *Examining beauty: Theory, assessment and treatment of body image disturbance*. Washington DC: American Psychological Association.
- Tiggemann, M., & Slater, A. (2004). Thin ideals in music television: A source of social comparison and body dissatisfaction. *International Journal of Eating Disorders*, 35(1), 48–58. doi: 10.1002/eat.10214
- Wankel, L.M., & Berger, B.G. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research*, 22, 167-182.
- Whitney, E. A., & Rolfes, S. R. (1996). *Understanding nutrition (7th Ed.)*. New York: West Publishing Company.
- Widiger, T. A., & Sankis, L. M. (2000). Adult psychopathology: Issues and controversies. *Annual Review of Psychology*, 51, 377–404. doi: 10.1146/annurev.psych.51.1.377
- Wood, J. V. (1989). Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin*, 106, 231-248.
- Wolke, D., & Sapouna, M. (2008). Big men feeling small: Childhood bullying experience, muscle dysmorphia and other mental health problems in bodybuilders. *Psychology of Sport and Exercise*, 9, 595–604. doi:10.1016/j.psychsport.2007.10.002



Mark Suffolk is a Ph.D student on the Developmental Science program at North Dakota State University. His research interests are the development and maintenance of male body Image pathology. His contact e-mail is m.suffolk-o8@alumni.lboro.ac.uk.

NEW MALE STUDIES: AN INTERNATIONAL JOURNAL (NMS) IS AN OPEN ACCESS ONLINE INTERDISCIPLINARY JOURNAL FOR RESEARCH AND DISCUSSION OF ISSUES FACING BOYS AND MEN WORLDWIDE. THIS JOURNAL USES OPEN JOURNAL SYSTEMS 2.3.4.0, WHICH IS OPEN SOURCE JOURNAL MANAGEMENT AND PUBLISHING SOFTWARE DEVELOPED, SUPPORTED, AND FREELY DISTRIBUTED BY THE PUBLIC KNOWLEDGE PROJECT UNDER THE GNU GENERAL PUBLIC LICENSE.

THIS ARTICLE HAS BEEN DOWNLOADED FROM [HTTP://NEWMALESTUDIES.COM](http://newmalestudies.com).