

Université de Montréal

The Influence of Sociocultural Factors on Attitudes and Behaviours toward Eating, Weight, and  
Body Image: A Comparative Study of Heterosexual and Gay Men

Par

Olivier Di Pietrantonio

Département de Psychologie

Faculté des Arts et des Sciences

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*Cette thèse intitulée*

**The Influence of Sociocultural Factors on Attitudes and Behaviours toward Eating,  
Weight, and Body Image: A Comparative Study of Heterosexual and Gay Men**

*Présentée par*

**Olivier Di Pietrantonio**

*A été évaluée par un jury composé des examinateurs suivants*

**Sophie Bergeron**  
Présidente

**Dominique Meilleur**  
Directrice de recherche

**Marie-Ève Daspe**  
Membre du jury

**Jacinthe Dion**  
Examinatrice externe

## Résumé

Chez les hommes, l'exposition aux corps musclés présentés par les médias traditionnels (p.ex., la télévision) est liée à une augmentation des comportements et attitudes potentiellement nocifs à l'égard de l'image corporelle et de l'alimentation (CAPNICA; p.ex., l'insatisfaction corporelle) de façon directe et indirecte, par le biais de l'internalisation d'un idéal corporel musclé et de la comparaison sociale. L'utilisation des médias numériques, notamment les médias sociaux (MS; p.ex., Instagram) et les applications de rencontres (AR; p.ex., Tinder), est devenue plus fréquente chez les hommes comparativement aux médias traditionnels. L'accessibilité aux médias numériques ainsi que leur nature inhérente centrée sur les images et l'apparence font en sorte que leur utilisation pourrait avoir un effet négatif sur la perception qu'ont les hommes de leur image corporelle. De plus, l'utilisation des MS et AR est plus fréquente chez les hommes gais et pourrait potentiellement contribuer à la prévalence plus élevée des CAPNICA chez ce groupe par rapport aux hommes hétérosexuels. Toutefois, l'utilisation des MS et AR chez les hommes et sa relation avec les CAPNICA demeure peu approfondie; la variation potentielle de cette relation selon l'orientation sexuelle demeure inexplorée. La présente thèse visait donc à examiner l'utilisation des MS et AR chez les hommes, son association avec les CAPNICA et les mécanismes pouvant sous-tendre cette association, tout en considérant l'orientation sexuelle des hommes. Deux études empiriques ont été effectuées afin d'atteindre cet objectif.

La première étude visait à 1) décrire et comparer l'utilisation des MS (c.-à-d., Facebook, Instagram, Snapchat) et des AR chez les hommes hétérosexuels et gais et 2) évaluer les CAPNICA (insatisfaction à l'égard du gras corporel et de la musculation, symptômes liés aux troubles alimentaires, comportements liés à la musculation) et explorer si ceux-ci varient en fonction de

l'orientation sexuelle et de l'utilisation des MS et AR. L'échantillon comprenait 382 hommes ( $n$  hétérosexuels = 261;  $n$  gais = 121) âgés de 18 à 30 ans. Les données ont été recueillies par le biais de questionnaires auto-rapportés. Les résultats indiquent que l'utilisation des MS et AR, de même que les CAPNICA, étaient significativement plus élevés chez les hommes gais que chez les hommes hétérosexuels. Certains symptômes liés aux troubles alimentaires (c.-à-d., préoccupations liées à l'alimentation, à la forme du corps et au poids) étaient significativement plus élevés chez les utilisateurs gais d'AR par rapport aux non-utilisateurs gais et aux hommes hétérosexuels. De façon générale, les niveaux de CAPNICA ne différaient pas entre les utilisateurs et non-utilisateurs des MS à l'étude.

La deuxième étude visait à explorer 1) si l'utilisation des MS (c.-à-d., Facebook, Instagram, Snapchat) et des AR est associée aux CAPNICA (insatisfaction corporelle, symptômes liés aux troubles alimentaires, comportements liés à la musculation); 2) si l'internalisation de l'idéal corporel musclé et la comparaison sociale sous-tendent ces associations; et 3) si ces effets médiateurs varient en fonction de l'orientation sexuelle. L'échantillon comprenait 396 hommes ( $n$  hétérosexuels = 266;  $n$  gais = 130). Les données ont été récoltées par le biais de questionnaires auto-rapportés. Les résultats soutiennent peu le lien direct entre l'utilisation des médias numériques, notamment les MS, et les CAPNICA. Cependant, un lien indirect a été observé entre chaque plateforme numérique et chaque CAPNICA à l'étude par le biais d'au moins une des variables de médiation proposées. Enfin, la comparaison sociale ressort comme une voie par laquelle l'utilisation des AR pourrait mener à une augmentation des symptômes liés aux troubles alimentaires chez les hommes gais spécifiquement.

Globalement, les résultats de la présente thèse suggèrent que la considération d'une pluralité de plateformes, de préoccupations et comportements liées à l'image corporelle et de caractéristiques individuelles est essentielle à une compréhension nuancée des associations entre l'utilisation des médias numériques et les CAPNICA chez les hommes. Ces résultats peuvent également avoir d'importantes implications pour le développement de stratégies de littératie numérique visant l'atténuation de l'influence potentiellement négative de l'utilisation des médias numériques sur les CAPNICA des hommes.

**Mots-clés :** Image corporelle, médias numériques, internalisation de l'idéal corporel, comparaison sociale, orientation sexuelle, hommes

## Abstract

Exposure to images of lean, muscular bodies transmitted by traditional media (e.g., television) has consistently been associated with an increase in men's potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB; e.g., body dissatisfaction) directly and indirectly, through muscular-ideal internalization and appearance comparisons. Men's use of digital media, namely social networking sites (SNS; e.g., Instagram) and dating applications ("apps"; e.g., Tinder), has come to surpass their use of traditional media. The accessibility and highly appearance-focused nature of these platforms suggests that their use may be deleterious to men's body image. Moreover, SNS and dating apps are more frequently used by gay men, and may contribute to the higher rates of PUBIFRAB reported by this group, relative to heterosexual men. However, men's SNS and dating app use and its relation to PUBIFRAB have received little research attention; sexual orientation-based variations in these associations remain unexplored. The present thesis aimed to elucidate men's SNS and dating app use, its association with PUBIFRAB, and the mechanisms that underly this association. In all instances, sexual orientation-based variations were considered. Two empirical studies were conducted to meet this objective.

The first study aimed to 1) describe and compare heterosexual and gay men's SNS (i.e., Facebook, Instagram, Snapchat) and dating app use and 2) evaluate and explore sexual orientation- and user status-based variations in men's PUBIFRAB. The sample consisted of 382 men ( $n$  heterosexual = 261;  $n$  gay = 121) aged 18 to 30. Data were collected using self-report questionnaires. Results showed that, overall, SNS and dating app use was significantly more prevalent among gay men than heterosexual men. A similar pattern emerged for PUBIFRAB. Levels of eating disorder symptoms (i.e., eating, shape, and weight concern) were significantly

greater among gay dating app users than gay non-users and heterosexual men. Overall, levels of PUBIFRAB did not differ between users and non-users of each SNS under study.

The second study aimed to explore 1) whether men's use of SNS (i.e., Facebook, Instagram, Snapchat) and dating apps are associated with PUBIFRAB (body dissatisfaction, eating disorder symptoms, and muscle-building behaviour); 2) whether these associations are mediated by muscular-ideal internalization and appearance comparisons; and 3) whether these mediation effects vary according to men's sexual orientation. The sample comprised 396 men ( $n$  heterosexual = 266;  $n$  gay = 130) aged 18 to 30. Data were obtained via self-report questionnaires. Overall, results provided little evidence for direct associations between digital media use, namely SNS, and PUBIFRAB among both groups of men. However, there was an indirect association between men's use of each digital media platform and each outcome variable under study through at least one of the proposed mediators. Finally, appearance comparisons emerged as a potential pathway through which dating app use may increase disordered eating among gay men, specifically.

Overall, the results of the present thesis suggest that the consideration of a plurality of platforms, body image concerns, and individual characteristics is essential to a nuanced understanding of the association between men's digital media use and PUBIFRAB. They may also have important implications for the development of digital media literacy-related strategies with the potential to attenuate the possible negative influence of digital media on men's PUBIFRAB.

**Keywords:** Body image, digital media, appearance-ideal internalization, appearance comparison, sexual orientation, men

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## **List of Abbreviations**

ANOVA	Analysis of covariance
BMI	Body mass index
CI	Confidence interval
DMS-DM	Drive for Muscularity Scale: Muscle-oriented Behaviour subscale
EDE-Q	Eating Disorder Examination Questionnaire
MBAS-R	Revised Male Body Attitudes Scale
PACS-R	Physical Appearance Comparison Scale-Revised
PUBIFRAB	Potentially unhealthy body image- and food-related attitudes and behaviours
SATAQ-4R	Sociocultural Attitudes Towards Appearance Questionnaire-4-Revised
SNS	Social networking sites

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# Chapter 1: Theoretical Context

## Body Image: A Gendered Construct

Body image is a wide-ranging, multidimensional construct that encompasses individuals' thoughts, feelings, attitudes, and behaviours regarding their physical appearance (Muth & Cash, 1997). This construct can be broken down into two main components, namely body image evaluation and body image investment (Morrison et al., 2004). The first refers to individuals' thoughts, beliefs, and emotions relating to their physical appearance (i.e., body [dis]satisfaction; Muth & Cash, 1997). The second component relates to the importance individuals place on their physical appearance and, in particular, the behaviours they perform to manage their appearance (Cash & Szymanski, 1995; Morrison et al., 2004; Muth & Cash, 1997). Although the components of body image are conceptually distinct, they are intimately related to one another (Morrison et al., 2004). For example, body dissatisfaction is associated with, and often accompanied by, investment behaviours such as dieting or food restriction, purging (e.g., vomiting, laxative use), binge eating, and exercise (Donovan et al., 2014; Forrest & Stuhldreher, 2007; Haddad et al., 2019; Kong et al., 2013). It is precisely these types of attitudes and behaviours that constitute the central topic of the present thesis. When referenced together, they will hereupon be referred to as potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB).

Historically, men have been considered unencumbered by PUBIFRAB (McCreary, 2011). Several interrelated factors may account for this. Early comparative studies have consistently shown that PUBIFRAB (e.g., body dissatisfaction, disordered eating, appearance-motivated exercising) are far more prevalent in female samples than in male samples (Demarest & Allen,

2000; Elgin & Pritchard, 2006; Lokken et al., 2003; Lowery et al., 2005; McDonald & Thompson, 1992; Pingitore et al., 1997; Tiggemann & Pennington, 1990). Moreover, these attitudes and behaviours constitute important factors contributing to the onset and maintenance of eating disorders (i.e., anorexia nervosa, bulimia nervosa; Stice, 2002; Stice et al., 2011), which are also more prevalent among women, relative to men, at a rate of approximately 10:1 (American Psychiatric Association, 2013). Perhaps unsurprisingly, these findings favoured a disproportionate focus on thinness within body image research, as this characteristic is central to women's body image concerns (Cafri & Thompson, 2004; McCreary, 2011; Thompson et al., 1999). Altogether, these factors have stoked a longstanding belief that PUBIFRAB are a “female problem”, insofar as they appear to be more strongly associated with women's psychological difficulties (Murnen, 2011). Consequently, men's body image has received little attention relative to that of women (Murray et al., 2020; Murray et al., 2017). More recently, however, scholars began to consider the possibility that an emphasis on thinness inadvertently obscured fundamental gender-based differences in PUBIFRAB and came to both ponder the exact nature of these attitudes and behaviours among men and re-evaluate their assessment methods (Cafri & Thompson, 2004; McCreary, 2011). This shift in focus favoured an unprecedented expansion in the understanding of the nature and prevalence of men's PUBIFRAB (Ridgeway & Tylka, 2005). The following section aims to provide a succinct summary of the current state of knowledge on this topic.

## **PUBIFRAB: The Male Experience**

### **Body image evaluation: the centrality of lean muscularity**

Early investigations into the nature of male body image focused on discrepancies between men's perceived and ideal (i.e., desired) body (Tiggemann et al., 2007). This was generally



accomplished via the use of figure rating scales requiring participants to select their perceived and ideal body from a series of drawings of male silhouettes ranging from very thin to very large (Cafri & Thompson, 2004; Tiggemann et al., 2007). This revealed that a large proportion of men show a marked preference for a body that is larger than how they perceive themselves to be (Brodie et al., 1991; Cohn & Adler, 1992; Cohn et al., 1987; Jacobi & Cash, 1994). This wish to be larger seems to reflect a desire to gain muscle mass, as opposed to body fat (Tiggemann et al., 2007). Indeed, men report preferring a mesomorphic build, characterized by muscularity, over an ectomorphic or endomorphic build, characterized by thinness and fatness, respectively (Mishkind et al., 1986; Vertinsky, 2007). In fact, these latter body types have been associated with the greatest levels of body dissatisfaction among men (Tucker, 1982). Men's silhouette selections on figure rating scales featuring varying degrees of muscularity, rather than adiposity, as well as their evaluation of specific body parts (e.g., chest, arms), also indicate a preference for a physique whose main feature is a high degree of muscularity (Grossbard et al., 2011; Lynch & Zellner, 1999; Moore, 1993; Tucker, 1982). Importantly, men consistently report a drive for muscularity (i.e., preoccupation with gaining muscle mass; McCreary & Sasse, 2000) that is greater than that of women (Edwards et al., 2014). Thus, just as thinness is central to women's body image, the drive for muscularity appears to play a central role in men's relationship to their body (Grogan, 2017).

Although men's desire to increase muscle mass is supported by a large body of literature (Edwards et al., 2014; Morrison et al., 2006; Murnen & Karazsia, 2017; Thompson & Cafri, 2007), other factors also appear to play an important role in men's appraisal of their body (Ridgeway & Tylka, 2005). To this point, while it is true that a large number of men report a desire to gain weight, a non-negligible portion of men wish to lose weight (Cohn & Adler, 1992; Davis &

Cowles, 1991; Drewnowski & Yee, 1987; Jacobi & Cash, 1994; Muth & Cash, 1997). Indeed, a U-shaped relationship exists between men's body mass index (BMI) and body dissatisfaction, whereby men with the lowest BMI (i.e., the thinnest) and the highest BMI (i.e., the heaviest) report being most dissatisfied with their body (Austin et al., 2009; Frederick, Forbes, et al., 2007; Frederick et al., 2006). Concordantly, quantitative studies conducted using an exploratory approach (i.e., one that did not constrict participants' answers by investigating muscularity, specifically) found that men wish to maintain low levels of body fat, namely to accentuate their muscularity (Ridgeway & Tylka, 2005). Thus, the desire to avoid excessive levels of body fat appears to be as central to men's body image as muscularity itself (Griffiths et al., 2013; Ridgeway & Tylka, 2005). Men's pursuit of lean muscularity has received much empirical support (Martins et al., 2007; Olivardia et al., 2004; Smolak & Murnen, 2008; Tiggemann et al., 2008; Tiggemann et al., 2007; Yelland & Tiggemann, 2003). In fact, when both body fat and muscularity are considered in investigations of young adult men's body image evaluation, up to 71% of men report being dissatisfied with their body fat and up to 96% of men report being dissatisfied with their muscularity (Frederick, Buchanan, et al., 2007). These findings contradict the previously held belief that men are not preoccupied by their body image (Murray et al., 2017).

### **Behavioural manifestations of the pursuit of lean muscularity**

A large body of literature indicates that men's pursuit of lean muscularity translates into numerous potentially unhealthy behaviours typically grouped into two categories, namely those oriented towards acquiring muscle mass and those geared towards eliminating body fat (Cafri et al., 2005; McCreary et al., 2007; Tod & Edwards, 2015). Regarding muscle-building behaviours, a meta-analysis by Tod and Edwards (2015) found that drive for muscularity was significantly

associated with men's engagement in weight-lifting and compulsive or excessive exercise (i.e., exercise that "interferes with important activities, [...] occurs at inappropriate times or in inappropriate settings, or [is continued] despite injury or other medical complications"; American Psychiatric Association, 2013, p. 346). Similar results were reported with respect to men's intended or actual use of muscle-building products (e.g., anabolic steroids; Tod & Edwards, 2015). In fact, prospective data has shown that the odds of using such products is more than four times greater among men who report a high drive for muscularity than among those with a low drive for muscularity (Eik-Nes et al., 2018). Men's desire to build muscle mass can also manifest itself through strictly regulated eating behaviour (Murray et al., 2017), such as eating frequently, often beyond the point of satiation, or liquifying meals to facilitate intake (Cafri et al., 2005; Griffiths et al., 2013; Murray, Maguire, et al., 2012; Murray, Rieger, et al., 2012; Murray et al., 2010).

Practices that support muscle growth (e.g., overconsumption of high-calorie foods) also generally engender a buildup of body fat capable of triggering dissatisfaction with the leanness of one's body (Lavender et al., 2017). To counter this, muscle-building behaviours often occur in conjunction with fat-burning behaviours to strike a balance between muscularity and leanness (McCreary et al., 2007). For instance, men's tendency to alternate between a diet characterized by a caloric surplus and one characterized by an insufficient caloric intake has been well documented (Cafri et al., 2005; McCreary et al., 2007; Murray et al., 2017). What is more, men's drive for muscularity has been consistently associated with non-weight training exercise (e.g., aerobic exercise; Tod & Edwards, 2015) and restrictive forms of disordered eating (Brennan et al., 2012; Duggan & McCreary, 2004; Mussap, 2008; Tod et al., 2013). In fact, this type of disordered eating

has been found to be up to eight times more likely among men with a high, rather than a low, drive for muscularity (Brennan et al., 2011; Eik-Nes et al., 2018).

The prevalence rates for the above-mentioned behaviours paint a startling picture. Up to one third of men report engaging in excessive forms of exercise or using muscle-building products, and almost half of men report engaging in muscle-building diets (Cafri et al., 2005; Guidi et al., 2009; Lavender et al., 2010; Nagata et al., 2020; Tran et al., 2019). Behaviours aimed at reducing body fat are no less common; over one quarter of men report engaging in weight loss diets (Cafri et al., 2005), while up to 35% of men report engaging in behaviours such as fasting, self-induced vomiting, and the use of diet pills or laxatives (Tran et al., 2019). Alarmingly, these types of behaviours have become significantly more prevalent among men over time (Mitchison et al., 2014; Murray et al., 2020). Moreover, they have been documented in community (i.e., non-clinical, non-athlete) samples (Brewster et al., 2017; Chittester & Hausenblas, 2009; Parkinson & Evans, 2006; Peters et al., 1999), suggesting that they may be commonplace within the general population. This is concordant with reports that appearance-based motivations (i.e., a desire to appear muscular), rather than performance-based motivations, typically underly men's engagement in these behaviours (Parent & Moradi, 2011; Peters et al., 1999; Wright et al., 2000).

### **Men's PUBIFRAB: associated risks**

Body image-related attitudes and behaviours can be situated along a continuum ranging from relatively benign to unhealthy or pathological (Parent, 2013). For instance, within the context of men's pursuit of lean muscularity, engaging in moderate levels of exercise can be safe and effective (Murray et al., 2017; Parent, 2013). If, however, this behaviour was to become a source

of marked guilt or anxiety (e.g., in the event of missing a scheduled workout), it could be considered problematic (Murray et al., 2017; Parent, 2013). In this way, body image- and food-related attitudes and behaviours may be deleterious in and of themselves, depending on their degree of severity. There is also evidence for an association between PUBIFRAB and various physical and psychiatric complications (McCreary et al., 2007). Engagement in (over)training, cyclical dieting, and product (e.g., steroid) use can engender long-term negative consequences to physical health including, but not limited to, physical injury, obesity, cancer, and deficiencies in metabolic, renal, cardiac, and endocrine functioning (Cafri et al., 2005; Kanayama et al., 2010; McCreary et al., 2007; Parent, 2013). Similarly, men's body dissatisfaction, as well as their engagement in cyclic dieting, muscle-building exercise, and use of muscle-building products (e.g., steroids) have been associated with eating disorder and muscle dysmorphia symptoms (Cafri et al., 2005; Kanayama et al., 2006; Maida & Lee Armstrong, 2005; McCreary et al., 2007; Parent, 2013; Robert et al., 2009). The impact of men's PUBIFRAB are not limited to body dysmorphic- and eating-related disorders, but extend to other psychological outcomes as well, including low self-esteem, appearance anxiety, binge drinking and illicit drug use, symptoms related to mood, obsessive-compulsive, and psychotic disorders, as well as overall psychosocial impairment and distress (Bentley et al., 2015; Brunet et al., 2010; Calzo et al., 2016; Chittester & Hausenblas, 2009; Doumit et al., 2018; Eik-Nes et al., 2018; Griffiths et al., 2016; Griffiths et al., 2019; Gulker et al., 2001; Hallsworth et al., 2005; Kanayama et al., 2010; S. E. McCabe et al., 2007; McCreary & Saucier, 2009; Mitchison et al., 2014; Nowell & Ricciardelli, 2008).

To summarize, the literature reviewed in the preceding sections indicates that men's body image concerns are not uncommon, but simply differ qualitatively from those of women (Murray

et al., 2020; Murray et al., 2017; Tylka & Andorka, 2012). Specifically, rather than being thinness-oriented, men's concerns center around a desire for lean muscularity (Grogan, 2017; Tiggemann, 2011). The pursuit of this body type has been linked to a series of PUBIFRAB (Cafri et al., 2005; Griffiths et al., 2013; Tod & Edwards, 2015), many of which have become increasingly prevalent in recent years (S. E. McCabe et al., 2007; Mitchison et al., 2014; Murray et al., 2020). Considering these findings, it seems crucial to both identify and better understand the factors capable of shaping and promoting the body ideal that seemingly underlies men's PUBIFRAB. Notably, this knowledge could potentially inform research-based prevention and intervention strategies. While several theoretical perspectives aim to elucidate the origins and consequences of men's PUBIFRAB (Cash & Smolak, 2011; Grogan, 2017; Murnen & Karazsia, 2017), the sociocultural perspective of body image has emerged as one of the dominant frameworks adopted by body image scholars (Tiggemann, 2011). This perspective, which provides the theoretical basis for the present thesis, will be presented in the section that follows.

## **Towards a Better Understanding of Men's PUBIFRAB: The Sociocultural Perspective**

While various theoretical models are grounded in the sociocultural perspective of body image (Filice et al., 2020), they converge on the central premise that every culture holds a set of body ideals and that these ideals are paramount to the genesis of PUBIFRAB (Tiggemann, 2011). Thompson et al.'s (1999) tripartite influence model is perhaps the most cited theoretical model operating within the sociocultural framework (Grogan, 2017). As is hinted by its appellation, this model proposes that body ideals are shaped and promoted through three sociocultural channels, namely one's family, peers, and the media (Thompson et al., 1999). These sources of influence are

believed to promote PUBIFRAB both directly and indirectly through two mediating mechanisms: appearance-ideal internalization and appearance comparisons (Thompson et al., 1999). Specifically, the tripartite influence model contends that constant exposure and pressure to adhere to cultural body norms leads to the adoption of these norms as one's own personal standard, all the while contributing to the tendency to engage in appearance comparisons (Tiggemann, 2011). In other words, cultural standards become an internalized reference point against which individuals come to judge and compare their appearance (Grogan, 2017; Tiggemann, 2011). Importantly, given the strict and often unrealistic nature of cultural body norms, most individuals inevitably fall short of them (Grogan, 2017; Tiggemann, 2011). It is this failure to measure up to the prescribed ideal that is believed to be the root cause of individuals' PUBIFRAB (Tiggemann, 2011).

The tripartite influence model was initially developed to better understand PUBIFRAB among women and girls (Thompson et al., 1999) and its application has generated a large body of evidence suggesting that thinness-oriented pressures promote PUBIFRAB through the theorized mediation mechanisms (Hardit & Hannum, 2012; Hazzard et al., 2019; Keery et al., 2004; Lovering et al., 2018; Papp et al., 2013; Rodgers et al., 2011; Shagar et al., 2019; Shroff & Thompson, 2006; Tylka & Subich, 2004; van den Berg et al., 2002). Men's predilection for a lean yet muscular physique (Tiggemann et al., 2008) and the dissatisfaction they report when they do not possess these characteristics (Frederick, Buchanan, et al., 2007) suggest that a parallel process may be operating for them (Tiggemann, 2011). Several cultural indicators appear to support this contention. For example, researchers have noted that the bodies of male models (Leit et al., 2001) and children's action figures (Baghurst et al., 2007; Pope et al., 1999) have displayed decreasing levels of adiposity and increasing levels of muscularity over time. The latter group of authors noted

that, in several cases, the proportions of contemporary actions figures' physique had come to exceed that which is humanly attainable. These overt displays of lean muscularity are accompanied by strict cultural discourses relating to men's bodies; namely, adherence to the mesomorphic physique is equated to health, fitness, and power, whereas deviations from it are equated with unattractiveness and personal inadequacies, such as lack of willpower (Grogan, 2017). Concordantly, men admit to feeling an external pressure to adhere to the lean yet muscular body type (Adams et al., 2005; Grogan & Richards, 2002; Morgan & Arcelus, 2009). By some reports, awareness of this pressure is present in boys as young as six years of age, suggesting that appearance-related socialization begins early on (Baghurst et al., 2007; Parent, 2013).

Given the cultural context described above, it is unsurprising that various forms of the tripartite influence model have been successfully applied to the understanding of PUBIFRAB in male samples (Girard et al., 2018; Halliwell & Harvey, 2006; Karazsia & Crowther, 2009, 2010; Menzel et al., 2011; Rodgers et al., 2012; Schaefer et al., 2021; Smolak et al., 2005; Stratton et al., 2015; Tylka, 2011; Tylka & Andorka, 2012). In the following sections, the elements proposed by the model, as well as empirical findings relating to their associations with men's PUBIFRAB, will be presented. Particular attention will be given to studies conducted with adult men and those pertaining to media influences, as these constitute a primary focus of the present thesis.

## **Sociocultural influences of men's PUBIFRAB**

### **Familial influences of men's PUBIFRAB**

As it relates to body image, the family acts as an important agent of socialization by establishing lifestyle patterns for eating, dieting, exercising, and the evaluation of the self and



others (Jones, 2011; Rodgers & Chabrol, 2009). This is achieved in two ways, namely by modelling evaluative (e.g., commenting negatively on one's own body) or appearance investment (e.g., dieting) behaviours and by directly commenting or criticizing individuals' appearance, eating habits, and exercise habits (Jones, 2011; Rodgers & Chabrol, 2009; Wang et al., 2014). Both factors have been linked to PUBIFRAB among men. Indeed, exposure to parents' comments about their own (Chng & Fassnacht, 2016; Rodgers et al., 2009) and others' weight and shape (Baker et al., 2000), as well as their modelling of dieting and weightlifting behaviours (Galioto et al., 2012; Keel et al., 2013), were found to be positively associated with drive for thinness, weight loss attempt frequency, disordered eating, and muscle-building behaviour. Likewise, familial appearance-related criticism (Baker et al., 2000; Chng & Fassnacht, 2016; Eisenberg et al., 2012; Rodgers et al., 2009) and encouragement to lift weights (Galioto et al., 2012) have been associated with increases in men's body dissatisfaction, disordered eating, and muscle-building behaviours. Investigations pertaining to men's perceived familial pressure to be lean or muscular have yielded similar results (Schaefer et al., 2021; Tylka, 2011; Tylka & Andorka, 2012).

#### Peer influences of men's PUBIFRAB

Appearance culture within peer groups is enacted and policed in much the same way as within the family, namely through modeling and direct feedback (Jones, 2011; Quiles Marcos et al., 2013). In a manner that is consistent with findings relating to familial influences of men's PUBIFRAB, peers' expression of body image concerns (Dryer et al., 2016; McArdle & Hill, 2009), as well as their modelling of fat-reducing (e.g., dieting; Gravener et al., 2008) and muscle-building (i.e., weightlifting; Galioto et al., 2012; M.P. McCabe & McGreevy, 2011) behaviours, have been linked to increases in drive for thinness, body dissatisfaction, muscle-building behaviour, and

symptoms of bulimia and muscle dysmorphia among men. Similar associations exist between various forms of peer feedback, including appearance-related comments, criticism or teasing (Forney et al., 2012; Galioto et al., 2012; Matera et al., 2018, 2019), encouragement to lose weight or gain muscle mass (Galioto et al., 2012; M.P. McCabe & McGreevy, 2011), and perceived pressure to be lean or muscular (Schaefer et al., 2021; Stratton et al., 2015; Tylka, 2011; Tylka & Andorka, 2012; Yeung et al., 2021) and men's PUBIFRAB. The simple provision of a space in which appearance-related conversations can take place constitutes an additional way in which peer groups contribute to PUBIFRAB (Quiles Marcos et al., 2013). Indeed, several studies have shown that hearing and engaging in "appearance talk" is common among men and associated with diminished feelings of attractiveness, as well as increased appearance investment, drive for muscularity, and eating disorder symptoms (Ahlich et al., 2019; Engeln et al., 2013; Jankowski et al., 2014; Martz et al., 2009; Matera et al., 2018, 2019; Tzoneva et al., 2015; Velkoff et al., 2019).

### Media influences of men's PUBIFRAB

Of the three factors proposed by the tripartite influence model, the media are deemed to be the most important promoter of sociocultural appearance norms (Girard et al., 2018; Tiggemann, 2011). Indeed, while family and peer influences contribute to PUBIFRAB (Mills & Fuller-Tyszkiewicz, 2017; Quiles Marcos et al., 2013), they are nested within a broader sociocultural context (Jones, 2011). That is to say, one's family and peers enact and impart, on a micro level, appearance norms and values communicated within the culture to which they themselves belong (Jones, 2011). The mass media, on the other hand, constitutes a macro-level communicator of cultural appearance norms and values, namely through its depictions of ideal representations of the body (Jones, 2011). This contention is consistent with evidence for a more robust association

between media-related appearance pressures and PUBIFRAB than between family- and peer-related appearance pressures and PUBIFRAB (Schaefer et al., 2021; Tylka, 2011; Tylka & Andorka, 2012).

Regarding the medias' promotion of male body ideals, specifically, research has shown that the use of sexually explicit and often scantily clad portrayals of men in advertisements has steadily increased since the 1980s, eventually becoming the predominant manner in which men are presented (Reichert et al., 1999; Ricciardelli et al., 2010; Rohlinger, 2002). These portrayals are not circumscribed to the realm of advertising; rather, they extend to several facets of mainstream media, including movies and television (Law & Labre, 2002; Pope et al., 2000). As men's bodies have become more visible in the media, they have also become increasingly lean and muscular, as evidenced by the analysis of magazine (Law & Labre, 2002; Leit et al., 2001; Schwartz & Andsager, 2011), film (Morrison & Halton, 2009), and video game (Martins et al., 2011) content. Importantly, these representations are presented as both realistic and achievable, despite often being digitally manipulated (Labre, 2005). Relatedly, the media do not present bodies in isolation; instead, they associate certain body types to particular traits (Morrison & Halton, 2009). Notably, muscularity is framed as both beneficial and inspirational and is associated with positive outcomes (e.g., sexual prowess) in both print (Labre, 2005; Ricciardelli et al., 2010) and electronic media (Morrison & Halton, 2009). Conversely, deviations from lean muscularity are depicted in a negative, sometimes derogatory manner (Labre, 2005; Ricciardelli et al., 2010). For example, Fouts and Vaughan (2002) reported positive associations between male sitcom characters' body weight, the frequency with which they make disparaging comments about their body, and audience reactions to these comments (i.e., laughter).

The media's promotion of increasingly lean and muscular male bodies coincides with epidemiological reports of steadily increasing rates of overweight and obesity among men (Bancej et al., 2015; Grogan, 2017; Kelly et al., 2008). Within the context of a growing discrepancy between men's actual physicality and that which is prescribed to them by the media, theory would dictate that men's exposure to idealized media content would be associated with PUBIFRAB (Thompson et al., 1999; Tiggemann, 2011). Consistently, M. P. McCabe et al. (2007) found that up to 70% of the men they surveyed agreed that the media feeds beliefs that they should lose weight or gain muscle mass. Relatedly, there is cross-sectional evidence for a positive relationship between perceived appearance-related pressure from the media and men's body surveillance, appearance anxiety, drive for thinness, drive for muscularity, and muscle dysmorphia symptoms (Carper et al., 2010; Dryer et al., 2016; Fernandez & Pritchard, 2012; Girard et al., 2018; Pritchard & Cramblitt, 2014; Tylka & Andorka, 2012; Yeung et al., 2021). Men's self-reported exposure to various forms of media, including print media (e.g., fitness or lifestyles magazines; Giles & Close, 2008; Morrison et al., 2003), electronic media (e.g., television, music videos; Cramblitt & Pritchard, 2013; Thornborrow et al., 2020), and pornography (Duggan & McCreary, 2004; Griffiths, Mitchison, et al., 2018; Morrison, Ellis, et al., 2007; Morrison, Morrison, et al., 2007; Tylka, 2015; Whitfield et al., 2018) has been positively linked to similar deleterious outcomes.

Experimental and longitudinal studies provide further, more robust evidence for the contention that idealized media content promotes PUBIFRAB in men. Indeed, numerous studies have shown that body dissatisfaction increases significantly among men exposed to muscular bodies featured in advertisements or popular men's magazines, relative to those exposed to neutral images (e.g., photos of products; Baird & Grieve, 2006; Hausenblas et al., 2003; Hobza & Rochlen,

2009; Hobza et al., 2007; Leit et al., 2002). These results have been reported even in instances where exposure to idealized images is brief (Lorenzen et al., 2004). Moreover, these findings extend to electronic forms of media, including television advertisements (Agliata & Tantleff-Dunn, 2004; Allen & Mulgrew, 2020; Hargreaves & Tiggemann, 2009), music videos (Mulgrew & Volcevski-Kostas, 2012), and videogames (Barlett & Harris, 2008; Sylvia et al., 2014). While longitudinal data is relatively sparse, there is evidence to suggest that men's exposure to objectifying media predict outcomes such as body monitoring over a period ranging from 12 (Aubrey, 2006) to 18 months (Peter & Valkenburg, 2014).

It is important to note that data on the relationship between media influences and men's PUBIFRAB, be they cross-sectional (Abbas & Karadavut, 2017; Green & Pritchard, 2003; Jhaveri & Patki, 2016; McArdle & Hill, 2009; Morrison, Ellis, et al., 2007; Pritchard & Cramblitt, 2014; Stratton et al., 2015) or experimental (Diedrichs & Lee, 2010; Johnson et al., 2007; Michaels et al., 2013; Taylor & Goodfriend, 2008), have not always been consistent. Nevertheless, a meta-analysis conducted by Barlett et al. (2008) revealed that the media exerted a small-to-moderate statistically significant negative effect on men's body esteem and body satisfaction in cross-sectional and experimental studies. These findings are paralleled by additional meta-analyses, which showed that experimental exposure to the media's portrayal of the male body ideal exerted a small-to-medium effect on body dissatisfaction (Blond, 2008) and other symptoms associated with eating disorders (Hausenblas et al., 2013) among men. Overall, the findings outlined above provide compelling, albeit largely cross-sectional evidence for a positive association between media-based appearance pressure (e.g., via idealized depictions of the male form) and men's PUBIFRAB.

## **Mediating mechanisms**

### Appearance-ideal internalization

As previously stated, the tripartite influence model stipulates that family, peers, and the media influence PUBIFRAB both directly and indirectly through two psychological mechanisms (Thompson et al., 1999). The first of these mechanisms is appearance-ideal internalization (Thompson et al., 1999), which represents “the extent to which an individual cognitively ‘buys into’ socially defined ideals of attractiveness” (Thompson & Stice, 2001, p. 181). From a theoretical standpoint, appearance-ideal internalization results from the promotion of body image standards by trusted sociocultural agents (Thompson & Stice, 2001). Specifically, the glorification and reinforcement of a specific set of body image norms is believed to facilitate individuals’ adoption of said norms as their personal standard and, subsequently, their attempts to mould their appearance to fit this standard (Karazsia et al., 2013; Paterna et al., 2021; Thompson & Stice, 2001). Given evidence that body ideals promoted by the family, peers, and the media are often unrealistic and, to a large extent, unattainable (Tiggemann, 2011), an association between the internalization of these ideals and PUBIFRAB is expected (Thompson et al., 1999).

The associations outlined above have garnered a great deal of support among men. First, interpersonal- (e.g., muscularity-related teasing; Girard et al., 2018; Matera et al., 2019) and media-related influence (e.g., perceived media pressure to be lean or muscular; Cramblitt & Pritchard, 2013; Fernandez & Pritchard, 2012; Giles & Close, 2008; Pritchard & Cramblitt, 2014; Tylka, 2015) have been linked to increases in muscular-ideal internalization. The latter variable has, in turn, been associated with increases in men’s PUBIFRAB (Bardone-Cone et al., 2008; Brewster et al., 2017; Daniel & Bridges, 2010; Parent & Moradi, 2011; Wiseman & Moradi, 2010).

Notably, a recent meta-analysis showed a medium-sized significant positive relationship between muscular-ideal internalization and men's body dissatisfaction (Paterna et al., 2021). Further support for the tripartite influence model stems from reports that muscular-ideal internalization acts as a significant mediator of the association between perceived appearance-related pressure from each of the proposed sociocultural factors (i.e., the family, peers, the media) and men's drive for muscularity, body fat dissatisfaction, muscularity dissatisfaction, muscle-building behaviour, and disordered eating (Karazsia & Crowther, 2009, 2010; Schaefer et al., 2021; Stratton et al., 2015; Tylka, 2011; Tylka & Andorka, 2012).

#### Appearance comparisons

Appearance comparisons are the second mediation mechanism proposed by the tripartite influence model (Thompson et al., 1999). In accordance with the stipulation that individuals have an innate drive to evaluate their opinions, abilities, and standing through self-other comparisons (Festinger, 1954), body image scholars have proposed that individuals attempt to evaluate their attractiveness by comparing their appearance to cultural appearance standards and to others' appearance (Myers & Crowther, 2009; Schaefer et al., 2021; Thompson et al., 1999). As with appearance-ideal internalization, the increasingly strict nature of the appearance norms promoted, modeled, and reinforced by sociocultural agents (i.e., family, peers, and the media) suggests that appearance comparisons are likely to result in negative self-appraisals and, ultimately, in PUBIFRAB (Schaefer et al., 2021; Thompson et al., 1999; Tiggemann, 2011).

In keeping with theory, significant positive associations have been documented between perceived pressure to adhere to the male body ideal by family and peers and appearance

comparisons among men (Karazsia & Crowther, 2009, 2010). Similarly, experimental exposure to media portrayals of muscular men have been found to provoke increases in men's appearance comparisons (Hargreaves & Tiggemann, 2009). Moreover, appearance comparisons have been identified as a significant correlate (Dondzilo et al., 2021; Karazsia & Crowther, 2010; Matera et al., 2018; Morrison et al., 2003; Myers & Crowther, 2009; O'Brien et al., 2009) and predictor (Allen & Mulgrew, 2020; Galioto & Crowther, 2013; McCreary & Saucier, 2009; Melki et al., 2015) of men's PUBIFRAB. Finally, there is evidence for a significant mediation effect of appearance comparisons on the positive association between perceived family, peer, and media pressures to be lean and muscular and various deleterious outcomes, such as drive for muscularity, muscularity dissatisfaction, muscle-building behaviour, disordered eating, and openness towards cosmetic surgery (Karazsia & Crowther, 2009; Lunde & Gyberg, 2016; Schaefer et al., 2021; Stratton et al., 2015; Tylka & Andorka, 2012).

To summarize, the literature reviewed in the preceding sections supports the applicability of the tripartite influence model to the study of men's body image. Indeed, data overwhelmingly suggest that family-, peer-, and media-related pressures are positively linked to men's PUBIFRAB both directly and indirectly, through muscular-ideal internalization and appearance comparisons (Karazsia & Crowther, 2009, 2010; Schaefer et al., 2021; Tylka, 2011; Tylka & Andorka, 2012). Media influences, in particular, have been the subject of a large number of studies (Barlett et al., 2008). While the latter line of research is essential given the media's reputation as the most important influencer of body image concerns (Girard et al., 2018; Tiggemann, 2011), it is limited by the fact that it has not evolved in tandem with the media landscape. Specifically, the bulk of the extant research focuses on traditional forms of media (e.g., television, magazines), whereas newer



forms of digital media have become more popular (Derenne & Beresin, 2018; Seidenberg et al., 2017). Notably, digital media possess unique features susceptible to influence PUBIFRAB (Fardouly & Vartanian, 2016; Perloff, 2014) and are frequently used by men (Seidenberg et al., 2017). Within this context, it seems important to elucidate men's use of digital media and its association with PUBIFRAB. The distinctive features of digital media platforms and preliminary findings regarding the association between men's digital media use and PUBIFRAB will be presented in the following sections.

## **New Media, New Threat?**

### **Defining characteristics of digital media**

While media has traditionally been consumed in print (e.g., magazines) and electronic (e.g., television) formats, the advent of the internet has favoured a shift towards digital mediums of media consumption (Derenne & Beresin, 2018). In fact, internet-based media has come to surpass traditional media in terms of popularity (Seidenberg et al., 2017). This shift has been facilitated by the emergence of handheld digital devices (e.g., smartphones) that provide immediate and constant access to increasing amounts of online material (Derenne & Beresin, 2018; Johnson, 2021). Social networking sites (SNS; e.g., Instagram) and dating applications ("apps"; e.g., Tinder) have proven to be especially popular digital media platforms (Smith & Anderson, 2018; Statista Research Department, 2021b). The former are digital platforms that facilitate communication and content-sharing (i.e., photos, videos) between members of an online community (Derenne & Beresin, 2018), whereas the latter are designed specifically to enable users to locate potential romantic partners (Filice et al., 2019; Tran et al., 2019). As of 2020, SNS and dating apps are used by 3.6 billion and 196 million individuals worldwide, respectively (Blumritt, 2021; Statista Research

Department, 2021a). Moreover, their use is frequent: systematic reviews of studies conducted with both men and women have found that individuals tend to visit these platforms multiple times per day and cumulate a daily usage time that averages two hours (Castro & Barrada, 2020; Ryding & Kuss, 2020).

In addition to being commonplace, SNS and dating apps possess several defining characteristics (Fardouly & Vartanian, 2016; Perloff, 2014). First, they tend to focus heavily on visual content (e.g., photos, videos; Birnholtz et al., 2014; Breslow et al., 2020; Fardouly & Vartanian, 2016). Relatedly, within these digital spaces, individuals have gone from being passive media consumers to being active agents (Holland & Tiggemann, 2016). Specifically, users are invited to create their own content and interact with other members of their online community through features such as “likes” and comments (Derenne & Beresin, 2018; Perloff, 2014). Importantly, individuals may equate the number of received “likes” and positive comments with self-worth (Derenne & Beresin, 2018). Perhaps for this reason, users tend to present an ideal version of themselves online, spending hours curating the “perfect” profile (Derenne & Beresin, 2018; Fardouly & Vartanian, 2016). They may, for example, experiment with taking multiple photos of themselves, choosing to post only the best one (Derenne & Beresin, 2018). Chosen photos may be further perfected using photo-editing tools (e.g., filters) made readily available by many SNS and dating app developers (Derenne & Beresin, 2018; Fardouly & Vartanian, 2016). Lastly, through various technological advances (e.g., the smartphone), individuals have been afforded the possibility of constant connection with online communities and limitless consumption of novel user-generated content (Paulson, 2020; Perloff, 2014).

As it relates to body image, the defining features of SNS and dating apps raise several concerns (Fardouly & Vartanian, 2016; Perloff, 2014). The first relates to the presence of images that are consistent with cultural appearance norms. Indeed, these images may be particularly prevalent in online environments where the production of visual content constitutes the primary means of self-expression (Derenne & Beresin, 2018). These platforms' evaluative components ("likes", comments) may further encourage and reinforce users' creation of ideal-accordant content (Chatzopoulou et al., 2020; Derenne & Beresin, 2018; Flannery et al., 2020). To this point, a content analysis of fitpiration posts (i.e., images promoting exercise and a healthy lifestyle) on Instagram, a photo-based SNS, revealed that the vast majority of posts featuring men were characterized by objectified portrayals of muscular bodies (Tiggemann & Zaccardo, 2018). Gültzow et al. (2020) extended these findings to general (i.e., non-fitness-related) depictions of men on Instagram. Notably, photos featuring the male body ideal were those that received the greatest level of engagement (i.e., "likes"; Gültzow et al., 2020). Testimony from users of Grindr, a popular dating app geared toward gay men, suggests that exposure to idealized and sexualized images of men's bodies is common on these types of platforms as well (Filice et al., 2019).

What is more, the possibility for constant connexion to SNS and dating apps suggests that users may be frequently and consistently exposed to the idealized content that is characteristic of these platforms (Filice et al., 2019; Gültzow et al., 2020; Perloff, 2014). In this way, these platforms may provide more opportunities for appearance-ideal internalization and appearance comparisons, relative to traditional media (Perloff, 2014). In addition, unlike traditional media, which mainly features models and actors, SNS and dating apps are essentially the media of one's peers (Arroyo & Brunner, 2016; Saiphoo & Vahedi, 2019). Thus, appearance comparisons made

while using these platforms may be especially detrimental (Derenne & Beresin, 2018; Filice et al., 2019). Indeed, research has shown that comparisons to proximal or seemingly realistic targets (e.g., peers) are more harmful than comparisons to distal targets (i.e., actors; Fardouly & Vartanian, 2016; Saiphoo & Vahedi, 2019). This effect may be compounded in digital spaces, where users are exposed to peers' idealized (i.e., edited) self-presentations (Derenne & Beresin, 2018). In this context, users may come to falsely believe that strict appearance ideals are easily attainable and experience distress when they feel that they are unable to measure up to their peers (Derenne & Beresin, 2018; Fardouly & Vartanian, 2016; Filice et al., 2019).

### **SNS use and men's PUBIFRAB**

Despite suggestions that SNS constitute an important risk factor for PUBIFRAB (Fardouly & Vartanian, 2016; Perloff, 2014), the SNS use-PUBIFRAB relationship has scarcely been investigated among men. Nevertheless, data available thus far suggest that men's use of these platforms, like their engagement with traditional media, may be detrimental (Saiphoo & Vahedi, 2019). A handful of qualitative studies conducted with young adult men (Chatzopoulou et al., 2020; Flannery et al., 2020; Piatkowski et al., 2020) provide insight into both the body image-related pressure they experience as a result of SNS use and its consequences. Specifically, these men tend to agree that depictions of the male body ideal, which they qualify as unrealistic and unattainable, are widely circulated on SNS (Flannery et al., 2020). Relatedly, many male users admit that their posts are often motivated by a desire to obtain appearance validation from their friends, all the while recognizing that this type of praise could reinforce potentially unhealthy behaviours meant to modify their weight or shape (Flannery et al., 2020). Indeed, lean muscularity is said to be essential to popularity (i.e., followers, "likes", positive comments) on SNS, whereas

deviations from the male body ideal are discouraged through negative comments (Chatzopoulou et al., 2020). This pressure leads men to present the most positive version of themselves online, often through photo editing, and to engage in, repeat, or intensify unhealthy body change behaviours (e.g., exercising despite injury, steroid use) to maintain lean muscularity (Chatzopoulou et al., 2020).

Quantitative studies provide similar, albeit somewhat less consistent, findings. Comparisons of adult male SNS users to non-users have shown that users report less body satisfaction (Stronge et al., 2015) and are more likely to have applied for cosmetic surgery (Abbas & Karadavut, 2017) than non-users. Moreover, there is cross-sectional evidence for associations between men's SNS use and increases in PUBIFRAB. Various measures of young adult men's Facebook use, namely daily usage time, passive engagement (e.g., observing others' posts), and active engagement (e.g., posting content), have been positively linked to body surveillance and body shame (Hanna et al., 2017; Manago et al., 2015). Selfie posting on, and general use of, Instagram have been similarly associated with men's body dissatisfaction (Modica, 2020). Among sexual minority men, time spent on various digital media platforms was associated with increases in body fat and muscularity dissatisfaction, disordered eating, and thoughts about using steroids; these associations were strongest for image-centric platforms (i.e., Facebook, Instagram, Snapchat; Griffiths, Murray, et al., 2018). On the other hand, some authors have reported inconsistent associations between young adult men's SNS use and PUBIFRAB (Fatt et al., 2019), while others have reported that these constructs are unrelated among men (Abbas & Karadavut, 2017).

Although findings are not unanimous (Casale et al., 2021), a small number of experimental studies provide preliminary evidence for a causal link between men's SNS use and PUBIFRAB (Paulson, 2020; Tiggemann & Anderberg, 2020; Yee et al., 2020). In a sample of college-aged men, exposure to Instagram photos featuring muscular bare-chested men, but not fashionably dressed men or sceneries, provoked increases in body dissatisfaction; exposure to both bare-chested and fashionable men resulted in a greater desire to exercise, relative to exposure to images of sceneries (Tiggemann & Anderberg, 2020). Exposure to idealized depictions of men on Instagram, relative to neutral control images, were found to have a similar deleterious impact on young adult men's appearance and weight satisfaction (Paulson, 2020). Fitness-promoting and thinness-promoting images, which figure prominently on SNS, have also been considered in an experimental study (Yee et al., 2020). These authors found that men's body fat dissatisfaction, muscularity dissatisfaction, and urge to engage in fat-reducing and muscle-building behaviour increased following exposure to fitness-promoting images, relative to control images; findings pertaining to men's exposure to thinness-promoting content were less consistent (Yee et al., 2020).

Within the context of increasing evidence for the positive association between men's SNS use and body image concerns (Saiphoo & Vahedi, 2019), an elucidation of its underlying mechanisms appears crucial. Notably, although theoretical (Perloff, 2014) and qualitative (Chatzopoulou et al., 2020; Flannery et al., 2020) literature suggests that the mechanisms proposed by the tripartite influence model mediate this association among men, internalization and comparison processes have rarely been investigated as mediators of the SNS use-PUBIFRAB relationship within the context of quantitative studies. To the best of our knowledge, only four such studies exist (Fatt et al., 2019; Hanna et al., 2017; Modica, 2020; Tiggemann & Anderberg,

2020); most have focused exclusively on comparison processes. A first study by Hanna et al. (2017) found that overall Facebook use was positively associated with body shame, through appearance comparisons, in a sample of young adult men. Appearance comparisons also significantly mediated the association between men's overall Instagram use and body dissatisfaction (Modica, 2020), but not the association between young adult men's exposure to idealized depictions of men on Instagram and appearance satisfaction (Tiggemann & Anderberg, 2020). The only study to consider internalization processes demonstrated that muscular-ideal internalization mediated the positive association between young adult men's engagement with fitspiration posts on Instagram and appearance-based motivation to exercise (Fatt et al., 2019). These authors also found that men's fitspiration viewing was positively associated with body dissatisfaction and health-based motivation to exercise, through both muscular-ideal internalization and appearance comparisons.

### **Dating app use and men's PUBIFRAB**

Given that physical attraction constitutes the primary factor for success in online dating (Whitty, 2008), the desire to adhere to body ideals and showcase idealized traits may be particularly salient on dating apps. Indeed, it has been reported that, in an environment where one must compete for the limited attention of potential partners, dating app users often feel it is necessary to self-present in a sexual manner to stimulate interest (Filice et al., 2019). While scholars have underscored the pertinence of investigating individuals' navigation of such an image-focused and evaluative environment in relation to body image (Rodgers et al., 2020), studies on this topic remain scarce, particularly among men. Yet, men report spending more time on dating apps than their female counterparts (Rodgers et al., 2020).

Preliminary data regarding the association between men's dating app use and PUBIFRAB stem almost exclusively from studies of sexual minorities. Interviews conducted with sexual minority men of varying ages (i.e., 18 to 65) revealed that appearance-related criticism, discrimination, and rejection resulting from deviations from prescribed appearance norms are common on dating apps (Filice et al., 2019; Tran et al., 2020). Moreover, these experiences were said to result in body dissatisfaction and engagement in unhealthy weight- and shape-changing behaviours (Filice et al., 2019; Tran et al., 2020). Quantitative studies tend to corroborate these findings. Indeed, more frequent dating app use was linked to greater muscularity dissatisfaction and more frequent thoughts about steroid use among sexual minority men (Griffiths, Murray, et al., 2018). Less consistent findings were reported by Breslow et al. (2020), who found that both the number of dating apps used and the frequency of dating app use are positively related to sexual minority men's body surveillance, but unrelated to their body dissatisfaction. Miller and Behm-Morawitz (2020), on the other hand, reported that sexual minority men's dating app use is negatively associated with body dissatisfaction and unrelated to drive for thinness and drive for muscularity.

Studies conducted with mainly heterosexual male samples offer more consistent findings than those conducted with sexual minority men. Adult male dating app users reported significantly less body and face satisfaction and significantly more body shame and body surveillance than non-users (Strübel & Petrie, 2017). Similarly, engagement in various unhealthy weight- and shape-controlling behaviours (e.g., vomiting, steroid use) was found to be up to 15 times more common among male dating app users relative to non-users (Tran et al., 2019). Most recently, a study by Rodgers et al. (2020) showed that more frequent checking of dating apps and spending upwards



of one hour per day on these apps is associated with higher levels of body shame and a diminished perception of control over one's weight and shape among college-aged men.

Little-to-no attention has been given to internalization and comparison processes within the context of men's dating app use. Precursory findings suggest that both factors are more common among men who use dating apps, relative to non-users (Strübel & Petrie, 2017). There is also evidence for positive associations between dating app use and appearance-ideal internalization among sexual minority men (Breslow et al., 2020). As it relates to the mediation processes proposed by the tripartite influence model, the strongest support stems from qualitative studies of sexual minority men, who report that their exposure to idealized bodies while using dating apps facilitates appearance-ideal internalization and appearance comparisons (Filice et al., 2019; Tran et al., 2020). Importantly, the latter factor has been proposed as a primary pathway through which dating app use may negatively influence these men's body image (Filice et al., 2019). However, the potential mediation effects of internalization and comparison processes on the relationship between men's dating app use and PUBIFRAB remain unexplored using quantitative methods.

## **Sexual Orientation and Men's PUBIFRAB**

Several systematic reviews (Calzo et al., 2017; Miller & Luk, 2019; Parker & Harriger, 2020) and meta-analyses (Dahlenburg et al., 2020; He et al., 2020; Morrison et al., 2004) provide compelling evidence for a greater prevalence of PUBIFRAB among gay men, relative to their heterosexual counterparts. These studies have typically assessed differences in body (dis)satisfaction and eating disorder-related symptomatology. Regarding the former category, Morrison et al. (2004) reported a small, yet significant difference between heterosexual and gay

men's body satisfaction, whereby less satisfaction was detected among the latter group. More recent meta-analyses have similarly concluded that gay men report significantly greater levels of body dissatisfaction than heterosexual men, with small-to-medium effect sizes (Dahlenburg et al., 2020; He et al., 2020). As it relates to disordered eating, data presented in a series of reviews (Calzo et al., 2017; Miller & Luk, 2019; Parker & Harriger, 2020) indicate that exercise behaviours, binge eating, purging behaviours (e.g., self-induced vomiting), fasting, food restriction, and the use of fat-reducing and muscle-building products are more common among sexual minority men than heterosexual men. Given that gay men appear to constitute a subset of the male population that is particularly vulnerable to PUBIFRAB (Griffiths, Murray, et al., 2018), scholars have underscored the importance of further elucidating sexual orientation-based differences in men's body image concerns (Dahlenburg et al., 2020).

Some authors have suggested that homosexuality, in and of itself, constitutes a specific risk factor for men's PUBIFRAB (Boisvert & Harrell, 2010; Russell & Keel, 2002). Others, however, have cautioned against such conclusions, qualifying them as too simplistic, and have proposed that the differences observed between heterosexual and gay men's PUBIFRAB result from underlying individual or psychosocial factors (Lakkis et al., 1999). Notably, there is evidence for a greater sociocultural influence among gay men, particularly from the media (McArdle & Hill, 2009; Parker & Harriger, 2020). To this point, gay men report greater exposure to objectifying media than heterosexual men (Dakanalis et al., 2012; Duggan & McCreary, 2004). Moreover, gay men appear to be particularly susceptible to media influences (Carper et al., 2010; Morgan & Arcelus, 2009). For instance, McArdle and Hill (2009) found that the association between media influence and body dissatisfaction was stronger among gay men, relative to heterosexual men, even after

controlling for media use. Subsequent research has shown that this heightened susceptibility may relate to appearance-focused media, specifically (Gigi et al., 2016). However, these findings pertain exclusively to men's use of traditional media. Incidentally, appearance-related content figures prominently on digital media platforms, namely SNS and dating apps (Filice et al., 2019; Gültzow et al., 2020), and their use is reported to be more frequent among gay men, relative to heterosexual men (Seidenberg et al., 2017; Sumter & Vandenbosch, 2019). It is therefore plausible that SNS and dating app use contributes, at least in part, to the higher rates of PUBIFRAB reported by gay men, relative to heterosexual men. Nevertheless, potential sexual orientation-based differences in the association between these variables have received little-to-no research attention.

## **Gaps in the Extant Literature**

The literature reviewed in the preceding sections shows that men's PUBIFRAB are prevalent and associated with numerous deleterious outcomes (Cafri et al., 2005; Frederick, Buchanan, et al., 2007), thereby establishing them as an important topic of study. In accordance with sociocultural perspectives of body image (Tiggemann, 2011), researchers have demonstrated that men's exposure to depictions of lean muscularity on traditional forms of media is positively associated with PUBIFRAB both directly and indirectly, through internalization and comparison processes (Schaefer et al., 2021; Stratton et al., 2015). The influence of newer, digital forms of media (i.e., SNS, dating apps) has received relatively little research attention, despite their popularity and reports that they may be particularly deleterious (Blumritt, 2021; Fardouly & Vartanian, 2016; Perloff, 2014; Statista Research Department, 2021a). Although a handful of preliminary studies have provided invaluable insight into the relationship between men's use of these platforms and PUBIFRAB, they are not without limitations.

The first of these limitations relates to the types of digital media platforms considered, particularly in studies pertaining to SNS use. Several authors have noted that most investigations of the SNS use-PUBIFRAB association focus on Facebook (Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016). This is understandable, given that Facebook is the most widely used SNS (Smith & Anderson, 2018). Nevertheless, other platforms, some of which are more image-centric than Facebook (e.g., Instagram), are growing in popularity and merit researchers' attention (Fardouly & Vartanian, 2016; Griffiths, Murray, et al., 2018). In a related manner, the proliferation of SNS in recent years has prompted calls for studies that simultaneously consider multiple platforms to determine whether they relate differently to PUBIFRAB (Holland & Tiggemann, 2016). However, most studies have focused on a single SNS or used measures of general SNS use, presumably assuming equivalency across platforms. What is more, SNS and dating apps have rarely been investigated within the same study, save for one (Griffiths, Murray, et al., 2018). Yet, the identification of platform-specific variations in the association between men's use of digital media and PUBIFRAB appears pertinent, particularly as it relates to the elaboration of targeted strategies meant to attenuate body image concerns.

Moreover, the outcome variables studied in relation to men's SNS and dating app use have not always been assessed in a way that is consistent with recommendations by experts in the field (Cafri & Thompson, 2004; Griffiths, Murray, et al., 2018; Ridgeway & Tylka, 2005). Given the large body of evidence supporting men's idealization and pursuit of lean muscularity (Grogan, 2017), scholars have underscored the importance of assessing (dis)satisfaction with body fat and muscularity when investigating men's body image (Griffiths, Murray, et al., 2018; Ridgeway & Tylka, 2005). Be that as it may, this recommendation has not been systematically applied,

particularly in studies exploring the SNS use-PUBIFRAB relationship. Indeed, many of the studies reviewed assessed body dissatisfaction with a single, general item (e.g., “I am satisfied with the appearance, size, and shape of my body”; Stronge et al., 2015) or utilized measures of weight-related (di)satisfaction without considering participants’ concerns with muscularity (Fatt et al., 2019; Paulson, 2020). Moreover, only a handful of studies (Griffiths, Murray, et al., 2018; Miller & Behm-Morawitz, 2020; Tran et al., 2019) have explicitly assessed men’s SNS and dating app use in relation to their engagement in potentially unhealthy behaviours meant to reduce body fat (e.g., food restriction) or increase muscle mass (e.g., steroid use). These associations merit further elucidation, particularly in light of reports that men are increasingly engaging in behaviours consistent with the pursuit of the lean and muscular body commonly showcased on digital media platforms (Gültzow et al., 2020; Murray et al., 2020; Murray et al., 2017).

Additionally, while applications of the tripartite influence model have demonstrated that appearance-ideal internalization and appearance comparisons mediate the association between traditional media influences and men’s PUBIFRAB (Schaefer et al., 2021; Stratton et al., 2015), there is a dearth of research exploring whether SNS and dating app use is linked to men’s body image concerns through these same mechanisms. Extant research on the topic has focused almost exclusively on comparison processes, precluding the elaboration of firm conclusions relating to appearance-ideal internalization. What is more, the quantitative exploration of these indirect effects has been limited to studies on men’s SNS use. Given indications that both SNS and dating apps constitute online spaces that may be particularly conducive to appearance-ideal internalization and appearance comparisons (Paulson, 2020; Strübel & Petrie, 2017), it seems important to gain a more complete understanding of these processes across a variety of platforms.

Notably, this data may serve to inform and enrich existing strategies meant to attenuate men's PUBIFRAB, as these typically target internalization and comparison processes (Brown et al., 2017; Brown & Keel, 2015; Yager & O'Dea, 2010).

Finally, the present literature review has revealed limitations in the way sexual orientation has been addressed in extant research. Most studies exploring the association between men's SNS use and PUBIFRAB either did not assess participants' sexual orientation or utilized overwhelmingly (i.e.,  $\geq 79.9\%$ ) heterosexual samples. To date, only one study (Griffiths, Murray, et al., 2018) has explored this association among sexual minority men. Evidence for the greater prevalence of SNS use among gay men, relative to their heterosexual counterparts (Seidenberg et al., 2017), underscores the importance of gaining a better understanding of the potential impact of these platforms among the former group. Conversely, studies of the dating app use-PUBIFRAB relationship have disproportionately targeted sexual minority men. However, there is preliminary evidence to suggest that dating app use can be deleterious to heterosexual men as well (Strübel & Petrie, 2017; Tran et al., 2019), suggesting that this population should not be overlooked. In a related manner, past research has indicated that digital media use, susceptibility to appearance-focused media, appearance-ideal internalization, and appearance comparisons are more elevated among gay men in comparison to heterosexual men (Gigi et al., 2016; Seidenberg et al., 2017; Strübel & Petrie, 2020; Sumter & Vandenbosch, 2019). While this suggests that SNS and dating app use may be more harmful to gay men's body image, relative to their heterosexual counterparts, sexual orientation-based differences in the relationship between men's digital media use and PUBIFRAB remain unexplored. Here too, the pertinence of this line of inquiry is bolstered by its potential to inform targeted strategies whose aim is to reduce the burden of men's PUBIFRAB.

## **Aim of the Present Thesis and Description of the Studies**

The aim of the present thesis was to expand knowledge of men's SNS and dating app use, as well as its association with PUBIFRAB. To address certain limitations of extant studies on this topic, men's use of Facebook, Instagram, and Snapchat – three popular SNS previously identified as particularly image-centric (Griffiths, Murray, et al., 2018) –, along with their use of dating apps, were assessed in relation to various male-relevant PUBIFRAB (i.e., those relating to both body fat *and* muscularity; Cafri & Thompson, 2004). Specifically, men's body fat dissatisfaction, muscularity dissatisfaction, eating disorder symptoms, and muscle-building behavior constituted the dependent variables under study. Additionally, men's muscular-ideal internalization, appearance comparisons, and sexual orientation were considered in an attempt to further nuance the relationships between men's SNS and dating app use and PUBIFRAB. In accordance with reports that digital media use is most prevalent among individuals between the ages of 18 to 30 (Smith & Anderson, 2018; Statista Research Department, 2021b), the present thesis focused on young adult men within this age group, as they may be more susceptible to potential negative impacts of digital media use.

To address the general aim of the present thesis, two research studies were conducted and are presented in the form of separate research articles intended to be submitted for publication to peer-reviewed journals. The first study was descriptive and exploratory in nature and comprised two objectives. The first was to describe and compare patterns of Facebook, Instagram, Snapchat, and dating app use in a sample of heterosexual and gay young adult men. The second objective was to assess men's levels of body fat dissatisfaction, muscularity dissatisfaction, eating disorder symptoms, and muscle-building behaviour, and to explore whether they varied as a function of

sexual orientation and digital media user status (i.e., whether or not participants were users of each digital media platform under study). Regarding the study's first and second objectives, respectively, it was hypothesized that 1) the use of each digital media platform under study would be more prevalent among gay men, relative to heterosexual men and 2) levels of each PUBIFRAB under study would be greater among gay men, generally, and among gay SNS and dating app users, specifically, in comparison to their heterosexual counterparts; SNS and dating app users were also expected to report more PUBIFRAB than non-users. This study, titled "*Digital Media Use and Body Image Concerns among Heterosexual and Gay Men*", constitutes the second chapter of the present thesis.

The second study aimed to build upon the findings of the first study by further nuancing the digital media use-PUBIFRAB relationship. This was accomplished via the exploration of men's PUBIFRAB in relation to the intensity of their digital media use (i.e., the amount daily time spent on each platform under study), as opposed to their user status, as well as the exploration of underlying mechanisms of these associations. This study comprised two objectives. The first was to extend the application of Thompson et al.'s (1999) tripartite influence model to men's SNS and dating app use. Specifically, a cross-sectional model was tested to elucidate whether young adult men's daily usage time of Facebook, Instagram, Snapchat, and dating apps was associated with body dissatisfaction, eating disorder symptoms, and muscle-building behaviour, through muscular-ideal internalization and appearance comparisons. The second objective was to explore whether the strength of these indirect associations varied according to men's sexual orientation. Two hypotheses were formulated with respect to this first objective, namely that men's daily usage time of SNS and dating app use would be positively associated with each PUBIFRAB under study,



and that these associations would be mediated by muscular-ideal internalization and appearance comparisons. As it relates to the study's second objective, it was hypothesized that the aforementioned mediation effects would be stronger among gay men, relative to heterosexual men. This study, titled "*The Role of Muscular-ideal Internalization, Appearance Comparisons, and Sexual Orientation in the Relationship of Digital Media Use to Men's Unhealthy Body Image- and Food-related Attitudes and Behaviours*", constitutes the third chapter of the present thesis.

## Chapter 2: First Article

Digital Media Use and Body Image Concerns among Heterosexual and Gay Men

Olivier Di Pietrantonio (B.A.)<sup>a</sup>, Dominique Meilleur (Ph. D.)<sup>a</sup>

- a. Adolescence and Eating Disorders Research Laboratory, Department of Psychology, University of Montreal, Montreal, Quebec, Canada

## Abstract

Exposure to the male body ideal in traditional media (e.g., television) promotes men's potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB). In recent years, traditional media have been surpassed in popularity by digital media, such as social networking sites (SNS) and dating applications. Despite the prominence of the male body ideal on these digital media platforms, investigations into how their use relates to men's PUBIFRAB are scant and sexual orientation-based differences in this relationship have yet to be explored. The present study aimed to describe and compare heterosexual ( $n = 261$ ) and gay ( $n = 121$ ) men's SNS (i.e., Facebook, Instagram, Snapchat) and dating application use and assess and explore sexual orientation and user status-based variations in men's PUBIFRAB (i.e., body fat and muscularity dissatisfaction, eating disorder symptoms, muscle-building behaviour). Digital media use and PUBIFRAB were, for the most part, more prevalent among gay men than heterosexual men. Results provided little evidence for user status-based variations in men's PUBIFRAB, regardless of sexual orientation. However, eating disorder symptomatology was significantly greater among gay dating app users relative to gay non-users and heterosexual men. These results suggest that dating app use may represent an important target for interventions aiming to attenuate PUBIFRAB among gay men.

**Keywords:** Body image, social networking sites, dating applications, sexual orientation, men

## Introduction

Longstanding perceptions that body dissatisfaction and eating disorders are less common among men than women have resulted in the former group being the target of relatively little research attention (Murray et al., 2020; Murray et al., 2017). However, an ever-growing body of evidence negates this line of thinking, namely through the demonstration that men exhibit body image-related preoccupations that center around leanness and muscularity, rather than slenderness (Grogan, 2017). When considering these criteria, up to 90% of men report body dissatisfaction (Frederick et al., 2007) and up to 36% of men report engaging in unhealthy behaviours to control their weight or shape (e.g., fasting, anabolic steroid use; Tran et al., 2019). Concerningly, the prevalence of these attitudes and behaviours among men appears to be increasing over time (Mitchison et al., 2014; Murray et al., 2020). Given their contribution to quality-of-life impairment (Bentley et al., 2015; Mitchison et al., 2014) and various forms of psychopathology (e.g., depression, eating disorders; Calzo et al., 2016; Stice, 2002), a better understanding of men's potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB) seems crucial.

The adoption of a sociocultural perspective of body image has allowed scholars to uncover several powerful and pervasive factors that contribute to men's PUBIFRAB through the promotion of strict body ideals (Tiggemann, 2011; Tylka, 2011; Tylka & Andorka, 2012). Of these factors, the mass media are considered most important (Girard et al., 2018). To this point, exposure to media depictions of idealized male bodies has consistently been linked to men's PUBIFRAB (Barlett et al., 2008). The age of the smartphone, however, has facilitated a shift from traditional forms of media (e.g., television), which have been the topic of most extant research, to digital

forms of media (Derenne & Beresin, 2018; Holland & Tiggemann, 2016). In addition to being increasingly popular (Smith & Anderson, 2018; Statista Research Department, 2021), certain digital media platforms, namely social networking sites (SNS; e.g., Instagram) and dating applications (“apps”; e.g., Tinder), are highly image-centric (Fardouly & Vartanian, 2016), which suggests that exploring their use in relation to PUBIFRAB may be of particular importance. Notably, SNS and dating app use is particularly prevalent among gay men (Seidenberg et al., 2017; Sumter & Vandenbosch, 2019) and may account, at least in part, for the higher rates of PUBIFRAB reported by this group compared to heterosexual men (Calzo et al., 2017; He et al., 2020). Nevertheless, relationships between SNS and dating app use and PUBIFRAB remain understudied among men, generally, and gay men, specifically.

### **The sociocultural perspective of body image**

The sociocultural perspective of body image posits that body ideals exist in every culture (Tiggemann, 2011). As it pertains to men, the body ideal is one that is characterized by broad shoulders, a muscular yet lean stomach and upper body, and a narrow waist (Ridgeway & Tylka, 2005; Tiggemann, 2011). This ideal is shaped and promoted through various channels (i.e., the family, peers, the media; Thompson et al., 1999). Consequently, many men feel pressured to achieve a lean and muscular physique (Ridgeway & Tylka, 2005; Waling, 2017). However, most men do not naturally fit this ideal; epidemiological data suggests that rates of overweight and obesity have increased steadily over the last several decades (Kelly et al., 2008). The sociocultural perspective posits that PUBIFRAB result precisely from this discrepancy between how one’s body looks and the belief of how one’s body should look (Tiggemann, 2011). Accordingly, men consistently report a preference for a body that is both leaner and more muscular than their own

(Smith et al., 2011; Tiggemann et al., 2007) and this discrepancy has been linked to various forms of distress (Brewster et al., 2017; Cafri et al., 2005; McCreary et al., 2007; Raevuori et al., 2006), particularly among gay men (Kimmel & Mahalik, 2005; Williamson & Hartley, 1998).

## **Traditional media and men's PUBIFRAB**

The mass media has been instrumental in the propagation of an increasingly lean and muscular male body ideal (Tiggemann, 2011). In their analysis of *Playgirl* centerfolds over a 25-year period, Leit et al. (2001) noted an increase in models' muscularity and a decrease in their body fat over time. Movie stars' physique (Grogan, 2017), video game characters (Martins et al., 2011), and depictions of men in gay male-targeted magazines (Schwartz & Andsager, 2011) have evolved in an identical fashion, achieving proportions that exceed that which is attainable through natural means (Tiggemann, 2011). Given the trajectory of its depictions of the male body, it is unsurprising that research has repeatedly demonstrated a positive association between men's exposure to traditional media and PUBIFRAB (Barlett et al., 2008). Results have been consistent for both heterosexual and gay men across a range of mediums, including video (e.g., television; Agliata & Tantleff-Dunn, 2004; Allen & Mulgrew, 2020; Mulgrew & Volcevski-Kostas, 2012) and still images (e.g., magazines; Cramblitt & Pritchard, 2013; Duggan & McCreary, 2004), and a range of research designs, including correlational (Dakanalis et al., 2012; Melki et al., 2015) and longitudinal (Aubrey, 2006; Peter & Valkenburg, 2014) studies. Similarly, numerous meta-analyses have shown that experimental exposure to media portrayals of the male body ideal exerts a small-to-moderate effect on men's body dissatisfaction (Barlett et al., 2008) and eating disorder symptomatology (Hausenblas et al., 2013). What is more, Murray et al. (2020) have presented data evidencing that trends in men's perceptions of, and preoccupations with, their body have evolved

in tandem with the media's portrayal of increasingly lean and muscular men. Together, these findings appear to support the proposal that the media play a role in men's PUBIFRAB.

### **Digital media: defining characteristics**

Owing to several distinctive features, digital media, namely SNS and dating apps, may have a potent influence on men's PUBIFRAB (Perloff, 2014). They are increasingly visual mediums; several SNS (e.g., Instagram) and dating apps (e.g., Tinder) are almost exclusively dedicated to the posting and sharing of photos, offering few alternatives for users' self-expression (Birnholtz et al., 2014; Tiggemann & Zaccardo, 2018). Importantly, the male body ideal is commonly promoted on these platforms. For instance, an analysis of 1000 photos of men on Instagram revealed that the most depicted body type was characterized by lean muscularity (Gültzow et al., 2020). Similarly, users of the gay dating app Grindr report being regularly confronted with displays of muscular male bodies when using this platform (Filice et al., 2019). Given that the advent of the smartphone has allowed for constant connection to SNS and dating apps, opportunities for exposure to idealized depictions of male bodies have grown exponentially, far surpassing what was possible via traditional media (Paulson, 2020; Perloff, 2014).

Moreover, whereas traditional media is passively consumed, SNS and dating app users actively participate in these online environments by generating content and providing feedback to other users through features such as "likes" and comments (Perloff, 2014). The real-time evaluative component of these platforms may push users to present an ideal version of themselves online (e.g., by enhancing photos using readily available photo-editing tools; Derenne & Beresin, 2018; Fardouly & Vartanian, 2016; Paulson, 2020). Dating app users may be particularly

motivated to present in a way that is consistent with appearance norms, as physical attractiveness is the most important component of successful online dating (Rodgers et al., 2020; Whitty, 2008). Exposure to near-perfect, if not unrealistic, versions of one's peers, as opposed to the models and celebrities presented in traditional media, may be all the more deleterious, as it may fuel the notion that extreme appearance ideals are easily achievable, thereby favouring PUBIFRAB (Derenne & Beresin, 2018; Fardouly & Vartanian, 2016; Perloff, 2014; Rodgers et al., 2020).

### **Relating men's SNS and dating app use to PUBIFRAB**

Although recent reviews and meta-analyses have demonstrated a small yet significant relationship between SNS use and PUBIFRAB (Holland & Tiggemann, 2016; Saiphoo & Vahedi, 2019), they provide little insight into men's experience, as they were largely based on studies whose samples were mainly or exclusively composed of women. Only a handful of studies have addressed the SNS use-PUBIFRAB relationship among men, specifically. Qualitative investigations have revealed that male SNS users are aware of the proliferation of an idealized, yet unrealistic muscular physique on these platforms and believe this content impacts them negatively (Chatzopoulou et al., 2020; Flannery et al., 2020; Piatkowski et al., 2020). Specifically, these men believe their SNS use to be a source of body image anxiety and preoccupations regarding body enhancement (Piatkowski et al., 2020). Men also reported routinely monitoring their appearance and weight and engaging in disordered eating because of SNS use (Flannery et al., 2020). These findings are supported by quantitative data showing a positive relationship between time spent on various SNS (e.g., Facebook, Instagram) and men's body fat and muscularity dissatisfaction, disordered eating, drive for muscularity, thoughts about steroid use, and appearance-based motivation to exercise (Fatt et al., 2019; Griffiths et al., 2018). Experimental exposure to various



forms of idealized images of men on SNS (i.e., fashion images, images promoting weight loss, exercise or a healthy lifestyle), relative to neutral images, has been found to provoke a decrease in appearance satisfaction, as well as an increase in body fat and muscularity dissatisfaction and the desire to engage in behaviours that reduce body fat and increase muscularity (Paulson, 2020; Tiggemann & Anderberg, 2020; Yee et al., 2020).

Investigations of the dating app use-PUBIFRAB relationship among men have disproportionately targeted sexual minorities and have yielded mixed results. There have been reports of a positive association between dating app use and sexual minority men's body surveillance, muscularity dissatisfaction, and thoughts about steroid use (Breslow et al., 2020; Griffiths et al., 2018). However, these are accompanied by reports that time spent on dating apps is unrelated to sexual minority men's drive for thinness and drive for muscularity, and negatively related to their body dissatisfaction (Miller & Behm-Morawitz, 2020). More consistent results have been found in predominantly heterosexual samples, where daily dating app usage time was positively associated with face and body dissatisfaction, body surveillance, and body shame, and negatively associated with perceived control over weight and shape (Rodgers et al., 2020; Strübel & Petrie, 2017). In addition, the odds of engaging in unhealthy behaviours such as fasting, vomiting, and using laxatives, diet pills, steroids, and muscle-building supplements were found to be between 3.2 and 14.6 times greater among dating app users than non-users (Tran et al., 2019).

## **Purpose**

The studies outlined above provide preliminary evidence for the negative association between SNS and dating app use and men's PUBIFRAB, confirming the importance of exploring

this association among men. Even so, they are not without limitations. Studies have typically focused on a single online platform or have grouped different platforms into a singular category, making it difficult to identify platform-based differences in associations (Holland & Tiggemann, 2016). Furthermore, despite recommendations that leanness and muscularity should be a focal point in men's body image research (Cafri & Thompson, 2004; Griffiths et al., 2018; Ridgeway & Tylka, 2005), body fat- and muscularity-related attitudes and behaviours, specifically, have not been systematically assessed in relation to men's SNS and dating app use. Finally, there is a sexual orientation-based imbalance in the extant literature; studies on SNS use have disproportionately targeted heterosexual men, whereas those exploring dating app use mainly targeted gay men. This precludes a more complete understanding of the digital media use-PUBIFRAB association in different groups of men. Relatedly, there is reason to believe that gay SNS and dating app users would experience more PUBIFRAB than heterosexual users, as they use these platforms more frequently (Castro & Barrada, 2020; Seidenberg et al., 2017). This, however, remains unexplored.

Thus, the present study had two aims. The first was to describe and compare patterns of SNS (i.e., Facebook, Instagram, Snapchat) and dating app use in a group of heterosexual and gay men. It was predicted that SNS and dating app use would be more prevalent among gay men than heterosexual men (hypothesis 1). The second aim was to assess men's PUBIFRAB (i.e., body fat and muscularity dissatisfaction, eating disorder symptoms, muscle-building behaviour), while paying particular attention to sexual orientation- and user status-based variations in these attitudes and behaviours. It was hypothesized that PUBIFRAB would be more prevalent among gay men, generally, and gay SNS and dating app users, specifically, relative to their heterosexual counterparts; SNS and dating app users were also expected to have significantly higher levels of

PUBIFRAB than non-users (hypothesis 2). Reports that SNS and dating app use is most prevalent among young adults (Smith & Anderson, 2018; Statista Research Department, 2021) suggest that study of the digital media use-PUBIFRAB link in this age group may be particularly pertinent. Thus, the present study was conducted among men between the ages of 18 and 30.

## **Method**

### **Participants**

Data from a sample of 261 heterosexual and 121 gay men were analyzed. Sample demographics are presented in **Table 1**. The groups did not differ in terms of racial/ethnic identity, relationship status, or average body mass index (BMI). However, the group of gay men was slightly older and more educated than the group of heterosexual men. Additionally, the proportion of men reporting a larger household income was greater in the heterosexual group of men than the gay group of men.

### **Procedure**

Participants were recruited on university campuses and online (e.g., social media) between January 2018 and September 2020. Participation consisted of completing an online survey hosted by SimpleSurvey.com. Individuals were invited to read an informed consent form. Those who chose to participate were screened for eligibility based on the following criteria: being between the ages of 18 and 30, identifying as a cisgender man, and identifying as exclusively or predominantly heterosexual or homosexual. In all, 488 individuals responded to the informed consent form, with two responding 'no'. Of the remaining 486 entries, 39 did not respond beyond the informed consent form, 18 were under the age of 18 or over the age of 30, 30 did not meet sex-

or gender identity-related criteria, eight did not specify their sexual orientation, six identified as bisexual, and three identified as asexual. These individuals were removed from the sample, resulting in a final sample of 382 men. The present study was approved by the University of Montreal's *Comité d'éthique de la recherche en éducation et en psychologie* (CERAS-2017-18-052-P).

## Measures

**Demographics and sexual orientation.** Participants provided information regarding their age, weight, height, racial/ethnic identity, education level, household income, and relationship status. Reported weight and height were used to calculate participants' BMI (kg/m<sup>2</sup>; Health Canada, 2021). The single-item Kinsey Heterosexual-Homosexual Rating Scale (Kinsey et al., 1948) was used to assess participants' sexual orientation. From seven options ranging from 0 (*exclusively heterosexual*) to 6 (*exclusively homosexual*), with 3 (*bisexual*) as the midpoint, participants selected the descriptor that best represented them. An additional category of "X" (*no sexual contacts or reactions*) could also be selected. Consistent with previous research (Strübel & Petrie, 2020), participants were classified as heterosexual if they self-identified as exclusively or predominantly heterosexual (scores 0-2) and gay if they self-identified as exclusively or predominantly homosexual (scores 4-6).

**SNS and dating app use.** Participants indicated whether they were current users of the following SNS: Facebook, Instagram, and Snapchat. These platforms were chosen because they have previously been qualified as highly image-centric (Griffiths et al., 2018). Users indicated the amount of daily time spent on each platform using a rating scale ranging from 1 (*less than one*

*hour per day*) to 4 (*three hours or more per day*). The assessment of dating app user status and daily usage time was identical to that of SNS. Dating app users also indicated the number of apps currently used on a rating scale ranging from 1 (*one*) to 3 (*three or more*) and the main reason for dating app use from one of the following options: *friendship, dates, a relationship, sexual intercourse, or other*. The decision to assess general dating app use, rather than use of specific apps, was rooted in literature that suggests there is little overlap in the apps used by heterosexual and gay men (Groves et al., 2014).

**PUBIFRAB.** In accordance with recommendations that male-centric body image research should focus on attitudes and behaviours relating to lean muscularity (Griffiths et al., 2018), PUBIFRAB were operationalized as body fat and muscularity dissatisfaction, eating disorder symptoms, and muscle-building behaviour. These were assessed using measures developed specifically for men or for which normative data are available for men.

**Body dissatisfaction.** The Body Fat (five items) and Muscularity (seven items) subscales of the Revised Male Body Attitudes Scale (MBAS-R; Ryan et al., 2011) were used to assess body fat and muscularity dissatisfaction, respectively. Participants indicated their level of agreement with statements relating to each characteristic using a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Item responses were summed to derive subscale scores. Higher scores represent greater levels of dissatisfaction. The subscales demonstrated sound reliability in the scale development sample (Ryan et al., 2011) and among gay men (Griffiths et al., 2018). In the present study, Cronbach's alpha for the Body Fat subscale was .92 and .93 for heterosexual and gay participants, respectively; the alpha for the Muscularity subscale was .87 for both groups.

***Eating disorder symptoms.*** Core behavioural and cognitive eating disorder symptoms were measured with the Restraint, Eating Concern, Shape Concern, and Weight Concern subscales of the French version of the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994; Mailloux, 2013). The EDE-Q is one of the most widely used self-report measures of disordered eating offering normative data for heterosexual (Lavender et al., 2010) and gay men (Nagata et al., 2020). The Shape Concern subscale comprises eight items; remaining subscales comprise five items. Participants reported how often they had experienced a series of symptoms using a 7-point rating scale. Item responses were averaged to create subscale scores. Higher scores indicate a greater level of symptomatology. The EDE-Q has demonstrated adequate psychometric properties among undergraduate (Lavender et al., 2010) and gay men (Nagata et al., 2020). For heterosexual and gay men, respectively, Cronbach's alpha in the present study ranged from .76 (Restraint) to .88 (Shape Concern), and from .67 (Eating Concern) to .90 (Shape concern).

***Muscle-building behaviour.*** The 7-item Muscle-Oriented Behavior subscale of the Drive for Muscularity Scale (DMS-MB; McCreary & Sasse, 2000; McCreary et al., 2004) was used to assess engagement in muscle-building behaviour. Items were rated using a 6-point scale ranging from 1 (*never*) to 6 (*always*). Item responses were averaged to obtain the subscale score. Higher scores indicate a greater drive for muscularity. The psychometric properties of the DMS-MB have been established among undergraduate (McCreary et al., 2004) and gay (DeBlaere & Brewster, 2017) men. In the present study, Cronbach's alpha for the DMS-MB was .87 and .88 for heterosexual and gay men, respectively.

**Questionnaire translation.** The Body Fat and Muscularity subscales of the MBAS-R, as well as the DMS-MB, were translated into French using Brislin's (1970) back-translation method. Items were translated from the original English into French by the first author, then blindly translated back to English by a graduate student in clinical psychology. A group of raters composed of the first and second authors, as well as two graduate students in clinical psychology, examined the different versions for errors or discrepancies. Revisions were made until consensus was reached. The individuals involved in this process were fluent in English and French.

## **Results**

### **Descriptive statistics and group comparisons for SNS and dating app use**

Participants' SNS and dating app use is summarized in **Table 2**. Most of the sample used Facebook, Instagram, and Snapchat, with Facebook being the most popular SNS. For the most part, participants spent less than one hour per day on these platforms. One third of participants reported using dating apps. Most of these spent less than one hour per day on these platforms and had a single active profile. Casual dating was the most frequently cited reason for dating app use. Sexual orientation-based differences in digital media use were explored using chi-square tests (see **Table 2**). A significantly larger proportion of gay men, relative to heterosexual men, used Instagram and dating apps. The group difference for the latter platform was notable; half of gay men reported using dating apps compared to only one-quarter of heterosexual men. The proportion of men spending a greater amount of time per day on Facebook and Instagram was significantly larger within the group of gay men than the group of heterosexual men. The same pattern emerged with respect to daily time spent on dating apps; only gay men reported spending upwards of one hour per day on these apps. The proportion of men with a greater number of active dating app

profiles was also significantly larger within the gay group of men, relative to their heterosexual counterparts; most gay users reported having three active profiles, whereas most heterosexual users reported a single profile. There were no significant group differences with respect to motives for dating app use. Snapchat use was also roughly similar between groups.

### **Sexual orientation- and user status-based variations in PUBIFRAB**

Descriptive information and group comparisons for measures of body dissatisfaction, eating disorder symptoms, and muscle-building behaviour are presented in **Table 3**. Compared to heterosexual men, gay men reported significantly higher levels of body fat and muscularity dissatisfaction, eating concern, shape concern, and weight concern; a non-significant trend in the same direction was observed for levels of restraint. Engagement in muscle-building behaviour was significantly greater among heterosexual men than gay men.

To further nuance these group differences, two-way independent analyses of variance (ANOVA) were conducted to examine the interaction between sexual orientation (heterosexual/gay) and user status (yes/no) for Instagram, Snapchat, and dating app use, in relation to body dissatisfaction, eating disorder symptoms, and muscle-building behaviour. The Facebook use variable was excluded from analyses due to the small number of non-users ( $n$  heterosexual = 12;  $n$  gay = 2). These numbers preclude the detection of even a large effect size while maintaining statistical power at .80 with a set alpha of .05 (Cohen, 1992). To avoid redundancy with the above-mentioned sexual orientation-based differences in mean levels of PUBIFRAB, only the sexual orientation by user status interactions and user status main effects are reported below.



**Body fat dissatisfaction.** The sexual orientation by user status interactions were non-significant (Instagram,  $F(1, 371) = 2.52, p = .113, \text{partial } \eta^2 = .007$ ; Snapchat,  $F(1, 371) = 0.004, p = .947, \text{partial } \eta^2 < .001$ ; dating apps,  $F(1, 371) = 1.64, p = .202, \text{partial } \eta^2 = .004$ ). User status main effects were also non-significant (Instagram,  $F(1, 371) = 1.14, p = .287, \text{partial } \eta^2 = .003$ ; Snapchat,  $F(1, 371) = 2.53, p = .113, \text{partial } \eta^2 = .007$ ; dating apps,  $F(1, 371) = 0.23, p = .633, \text{partial } \eta^2 = .001$ ); on average, body fat dissatisfaction was similar among users and non-users of Instagram (users,  $M = 11.28, SD = 5.97$ ; non-users,  $M = 11.16, SD = 5.66$ ), Snapchat (users,  $M = 11.68, SD = 6.03$ ; non-users,  $M = 10.36, SD = 5.45$ ), and dating apps (users,  $M = 11.82, SD = 6.34$ ; non-users,  $M = 10.98, SD = 5.64$ ).

**Muscularity dissatisfaction.** The sexual orientation by user status interactions were non-significant (Instagram,  $F(1, 372) = 0.24, p = .628, \text{partial } \eta^2 = .001$ ; Snapchat,  $F(1, 372) = 0.77, p = .381, \text{partial } \eta^2 = .002$ ; dating apps,  $F(1, 372) = 2.18, p = .141, \text{partial } \eta^2 = .006$ ). The Instagram,  $F(1, 372) = 6.11, p = .014, \text{partial } \eta^2 = .016$ , Snapchat,  $F(1, 372) = 4.51, p = .034, \text{partial } \eta^2 = .012$ , and dating app,  $F(1, 372) = 5.57, p = .019, \text{partial } \eta^2 = .015$ , user status main effects were significant; on average, muscularity dissatisfaction was significantly greater among users than non-users of Instagram (users,  $M = 20.39, SD = 6.36$ ; non-users,  $M = 18.08, SD = 5.77$ ), Snapchat (users,  $M = 20.24, SD = 6.36$ ; non-users,  $M = 18.63, SD = 5.96$ ), and dating apps (users,  $M = 21.50, SD = 6.48$ ; non-users,  $M = 18.87, SD = 6.01$ ).

**Restraint.** The sexual orientation by user status interactions were non-significant (Instagram,  $F(1, 355) = 1.12, p = .290, \text{partial } \eta^2 = .003$ ; Snapchat,  $F(1, 355) = 2.51, p = .114, \text{partial } \eta^2 = .007$ ; dating apps,  $F(1, 355) = 3.81, p = .052, \text{partial } \eta^2 = .011$ ). The dating app user

status main effect was significant,  $F(1, 355) = 4.89, p = .028, \text{partial } \eta^2 = .014$ ; on average, restraint was greater among users ( $M = 0.95, SD = 1.27$ ) than non-users ( $M = 0.69, SD = 1.02$ ). The remaining user status main effects were non-significant (Instagram,  $F(1, 355) = 0.09, p = .764, \text{partial } \eta^2 < .001$ ; Snapchat,  $F(1, 355) = 2.13, p = .145, \text{partial } \eta^2 = .006$ ); on average, men's restraint was similar, regardless of Instagram (users,  $M = 0.82, SD = 1.17$ ; non-users,  $M = 0.68, SD = 0.96$ ) and Snapchat (users,  $M = 0.88, SD = 1.21$ ; non-users,  $M = 0.58, SD = 0.85$ ) use.

**Eating concern.** The sexual orientation by dating app user status interaction was significant,  $F(1, 347) = 3.96, p = .047, \text{partial } \eta^2 = .011$ . Eating concern was significantly greater among gay dating app users ( $M = 0.81, SD = 0.94$ ) than heterosexual users ( $M = 0.40, SD = 0.77$ ),  $F(1, 347) = 7.74, p = .006, \text{partial } \eta^2 = .022$ ; gay ( $M = 0.39, SD = 0.51$ ) and heterosexual ( $M = 0.36, SD = 0.78$ ) non-users reported similar levels of eating concern,  $F(1, 347) = 0.07, p = .788, \text{partial } \eta^2 < .001$ . Within the group of gay men, eating concern was significantly greater among users than non-users of dating apps,  $F(1, 347) = 8.13, p = .005, \text{partial } \eta^2 = .023$ ; this within group difference was not observed among heterosexuals,  $F(1, 347) = 0.14, p = .710, \text{partial } \eta^2 < .001$ . The sexual orientation by Instagram user status interaction,  $F(1, 347) = 0.24, p = .622, \text{partial } \eta^2 = .001$ , and sexual orientation by Snapchat user status interaction,  $F(1, 347) = 0.51, p = .478, \text{partial } \eta^2 = .001$ , were non-significant, as were the associated user status main effects (Instagram,  $F(1, 347) = 0.35, p = .554, \text{partial } \eta^2 = .001$ ; Snapchat,  $F(1, 347) = 1.16, p = .282, \text{partial } \eta^2 = .003$ ). On average, men's eating concern was similar regardless of Instagram (users,  $M = 0.48, SD = 0.85$ ; non-users,  $M = 0.37, SD = 0.60$ ) and Snapchat (users,  $M = 0.49, SD = 0.87$ ; non-users,  $M = 0.34, SD = 0.55$ ) use.

**Shape concern.** The sexual orientation by dating app user status interaction was significant,  $F(1, 345) = 5.50, p = .020, \text{partial } \eta^2 = .016$ . Among dating app users,  $F(1, 345) = 31.56, p < .001, \text{partial } \eta^2 = .084$ , and non-users,  $F(1, 345) = 10.34, p = .001, \text{partial } \eta^2 = .029$ , shape concern was significantly greater among gay men (users,  $M = 2.49, SD = 1.62$ ; non-users,  $M = 1.79, SD = 1.25$ ) than heterosexual men (users,  $M = 1.14, SD = 1.26$ ; non-users,  $M = 1.16, SD = 1.15$ ). Gay users also reported significantly greater shape concern relative to gay non-users,  $F(1, 345) = 8.63, p = .004, \text{partial } \eta^2 = .024$ ; this difference was not observed among heterosexual men,  $F(1, 345) = 0.01, p = .923, \text{partial } \eta^2 < .001$ . The sexual orientation by Instagram user status interaction,  $F(1, 345) = 0.12, p = .730, \text{partial } \eta^2 < .001$ , and sexual orientation by Snapchat user status interaction,  $F(1, 345) = 0.70, p = .404, \text{partial } \eta^2 = .002$ , were non-significant. There was a significant Snapchat user status main effect,  $F(1, 345) = 5.81, p = .016, \text{partial } \eta^2 = .017$ ; on average, shape concern was significantly greater among users ( $M = 1.61, SD = 1.45$ ) than non-users ( $M = 1.20, SD = 1.13$ ). The Instagram user status main effect was non-significant,  $F(1, 345) = 1.87, p = .172, \text{partial } \eta^2 = .005$ ; levels of shape concern were similar among users ( $M = 1.57, SD = 1.43$ ) and non-users ( $M = 1.25, SD = 1.15$ ).

**Weight concern.** The sexual orientation by dating app user status interaction was significant,  $F(1, 346) = 5.49, p = .020, \text{partial } \eta^2 = .016$ . Here too, gay men reported significantly more weight concern than heterosexual men, whether they were dating app users,  $F(1, 346) = 21.97, p < .001, \text{partial } \eta^2 = .060$ , (gay,  $M = 1.95, SD = 1.61$ ; heterosexual,  $M = 0.88, SD = 1.12$ ) or non-users,  $F(1, 346) = 4.29, p = .039, \text{partial } \eta^2 = .012$ , (gay,  $M = 1.28, SD = 1.23$ ; heterosexual,  $M = 0.89, SD = 1.08$ ). Moreover, weight concern was significantly higher among gay dating app users than non-users,  $F(1, 346) = 8.69, p = .003, \text{partial } \eta^2 = .024$ ; this difference was not observed

among heterosexual men,  $F(1, 346) = 0.01, p = .936, \text{partial } \eta^2 < .001$ . The sexual orientation by Instagram user status interaction,  $F(1, 346) = 0.19, p = .662, \text{partial } \eta^2 = .001$ , and sexual orientation by Snapchat user status interaction,  $F(1, 346) = 0.17, p = .681, \text{partial } \eta^2 < .001$ , were non-significant, as were the associated user status main effects (Instagram,  $F(1, 346) = 0.65, p = .421, \text{partial } \eta^2 = .002$ ; Snapchat,  $F(1, 346) = 1.44, p = .232, \text{partial } \eta^2 = .004$ ); on average, weight concern was similar regardless of Instagram (users,  $M = 1.20, SD = 1.35$ ; non-users,  $M = 0.95, SD = 1.04$ ) and Snapchat (users,  $M = 1.19, SD = 1.34$ ; non-users,  $M = 0.98, SD = 1.10$ ) use.

**Muscle-oriented behaviour.** The sexual orientation by user status interactions were non-significant (Instagram,  $F(1, 316) = 1.74, p = .189, \text{partial } \eta^2 = .005$ ; Snapchat,  $F(1, 316) = 1.53, p = .218, \text{partial } \eta^2 = .005$ ; dating apps,  $F(1, 316) = 0.61, p = .435, \text{partial } \eta^2 = .002$ ). User status main effects were also non-significant (Instagram,  $F(1, 316) = 0.44, p = .508, \text{partial } \eta^2 = .001$ ; Snapchat,  $F(1, 316) = 3.27, p = .072, \text{partial } \eta^2 = .010$ ; dating apps,  $F(1, 316) = 2.09, p = .149, \text{partial } \eta^2 = .007$ ); mean levels of muscle-building behaviour were similar among users and non-users of Instagram (users,  $M = 1.96, SD = 1.06$ ; non-users,  $M = 1.83, SD = 0.84$ ), Snapchat (users,  $M = 2.01, SD = 1.07$ ; non-users,  $M = 1.75, SD = 0.80$ ), and dating apps (users,  $M = 1.97, SD = 1.17$ ; non-users,  $M = 1.89, SD = 0.90$ ). The small effect of sexual orientation observed with the t-tests (see **Table 3**) became non-significant when adjusted for Instagram,  $F(1, 316) = 2.59, p = .109, \text{partial } \eta^2 = .008$ , and Snapchat,  $F(1, 316) = 3.65, p = .057, \text{partial } \eta^2 = .011$ , use.

## Discussion

While there is ample evidence to support the claim that digital media use is positively associated with PUBIFRAB among women (Saiphoo & Vahedi, 2019), male-centric studies are

scarce. Therefore, the present study explored men's use of various digital media platforms (i.e., Facebook, Instagram, Snapchat, dating apps) in relation to their body fat and muscularity dissatisfaction, eating disorder symptoms, and muscle-building behaviour, with particular attention given to potential sexual orientation- and user status-based variations.

### **SNS and dating app use**

The prediction that digital media use would be more prevalent among gay men than heterosexual men (hypothesis 1) was largely supported by the data. This difference was most evident for dating app use (i.e., user status, number of apps used, daily usage time). These results are consistent with reports that sexual minority individuals are almost twice as likely to use dating apps than their heterosexual counterparts (Sumter & Vandenberg, 2019). Regarding SNS, Instagram use was significantly more prevalent among gay men than heterosexual men, in terms of both user status and frequency of daily use. A similar pattern emerged for daily time spent on Facebook. While a greater proportion of gay men, relative to heterosexual men, reported being users of Facebook and Snapchat and spending more daily time on Snapchat, these group differences were not statistically significant. Although it has been reported that gay men are quicker to embrace and adopt new forms of technology (Groves et al., 2014), the increasing ubiquity and accessibility of SNS may be prompting heterosexual men to adopt them in progressively comparable numbers (Gültzow et al., 2020).

### **PUBIFRAB: prevalence and role of sexual orientation and user status**

Levels of body fat and muscularity dissatisfaction, as well as eating, shape, and weight concern were significantly greater among gay men relative to heterosexual men. A similar, trend-level difference emerged for dietary restraint. These results are consistent with predictions

(hypothesis 2) and align with findings from previous comparative studies of heterosexual and gay men (He et al., 2020; Parker & Harriger, 2020). Muscle-building behaviour was significantly greater among heterosexual men than gay men. While counter to predictions, these findings converge with reports that heterosexual culture places greater value on muscle mass, whereas leanness is more valued by gay men (Dahlenburg et al., 2020). Consequently, it could be expected that each group of men would engage in behaviours most likely to emphasize the aspects of the male body ideal it values most (Smith et al., 2011). It should be noted, however, that while most of the above-mentioned group comparisons appear robust, with effect sizes ranging from medium to large (Cohen, 1988, 1992), the comparison relating to muscle-building behaviour exhibited the smallest effect size and a *p*-value that may become non-significant when accounting for test multiplicity (see **Table 3**). Indeed, muscle-building behaviour was the only outcome for which the observed sexual orientation-based differences became non-significant when adjusting for SNS use in the ANOVA. These results should therefore be interpreted with caution.

It was further hypothesized that PUBIFRAB would be most prevalent among users of SNS and dating apps, generally, and gay users, specifically (hypothesis 2); this was partially supported by the data. Of the platforms under study, dating apps were the sole platform for which significant sexual orientation by user status interaction effects were observed, suggesting that this platform may be particularly linked to gay men's PUBIFRAB, namely their eating, shape, and weight concern. These findings provide quantitative support for qualitatively derived reports that gay men may be particularly vulnerable to the impacts of dating app use through regular exposure to the sexualized depictions of male bodies characteristic of these platforms (Filice et al., 2019). It is unsurprising that gay men's navigation of this highly evaluative and competitive digital

environment would be associated with leanness-focused symptomatology, given their proclivity for this characteristic (Dahlenburg et al., 2020) and their belief that potential partners prefer a lean build (Smith et al., 2011).

When ignoring participants' sexual orientation, levels of PUBIFRAB were, for the most part, similar among users and non-users of the digital platforms under study, particularly SNS. Particularities of the study's sample might account for these results, which are in direct opposition to theoretical (Perloff, 2014) and empirical (Stronge et al., 2015) writings. Most SNS users in the current study reported daily usage times that were inferior to one hour; this represents less than half of the average daily usage time reported in a recent systematic review of men and women's SNS use (Ryding & Kuss, 2020). Given that positive relationships between SNS use and PUBIFRAB may result from a cumulative process (e.g., through repeated exposure to idealized bodies; Arroyo & Brunner, 2016), it may be that users in our study were not engaging with these platforms at a rate that would differentiate them from non-users. Moreover, scholars have suggested that certain motives for, and types of, SNS use might be particularly conducive to PUBIFRAB (Flannery et al., 2020; Saiphoo & Vahedi, 2019). Specifically, use motivated by a desire to compare oneself to others may be less adaptive than prosocial motives (Flannery et al., 2020). Similarly, engaging in appearance-focused activities (e.g., viewing idealized photos) is associated to PUBIFRAB to a greater extent than general use (Saiphoo & Vahedi, 2019). The present study does not allow to draw motive- and activity-related conclusions. Thus, the possibility that our participants were engaging with SNS in a way that limited the detection of a use-PUBIFRAB relationship cannot be excluded.

An additional explanation emerges when the relative absence of user status-based differences in PUBIFRAB are considered in conjunction with the observed sexual orientation-based differences. Namely, sexual orientation may be more informative to the elucidation of men's PUBIFRAB than SNS use. Gay men are subjected to pressures and stressors that their heterosexual counterparts are less likely to experience (Meyer, 1995; Siever, 1994). These stem both from society at large (e.g., sexual orientation-based stigmatization; Meyer, 1995) and from within the gay community, which may place a greater value on appearance (Siever, 1994). Incidentally, experiences of stigmatization and participation in the gay community have both been associated with gay men's PUBIFRAB (Brennan et al., 2012; Davids et al., 2015; Kimmel & Mahalik, 2005). Thus, gay men's experiences beyond the digital realm may be driving the elevated prevalence of PUBIFRAB in this group, relative to heterosexual men.

### **Limitations and implications for future research and practice**

The present study was not without limitations. The first concerns the generalizability of its results. The sample comprised mostly white cisgender young adult men, and results may not extend to more diverse samples. Moreover, online surveys, like the one utilized in the present study, may allow participants to address taboo topics, such as PUBIFRAB, more freely than other mediums (Gnambs & Kaspar, 2015). Nevertheless, this approach limits recruitment to individuals with internet access. Relatedly, data were self-reported and relied on participant recall. In this way, they may have been subject to bias or inaccuracies. The small number of Facebook non-users in our sample constitutes an additional limitation, as it precluded a more detailed investigation into the association between this platform's use and men's PUBIFRAB. Moreover, the possibility that results were subject to type 1 error due to test multiplicity cannot be discarded. They should



therefore be interpreted with caution and warrant replication. Finally, while sociocultural perspectives of body image posit that PUBIFRAB result from exposure to idealized depictions of men (Tiggemann, 2011), neither causality nor directionality can be inferred from the results of this study, given its cross-sectional design.

In addition to addressing the above-mentioned limitations, future research should aim to elucidate factors that may underly or affect the relationship between men's SNS and dating app use and PUBIFRAB. The measures of SNS and dating app use utilized in the present study contribute to an essential preliminary understanding of the way these platforms relate to PUBIFRAB. However, they may not provide a nuanced understanding of this relationship when used as stand-alone measures (Kim & Chock, 2015); this may be interpreted as an additional limitation of the present study. Investigating how online platform use and users' personal characteristics intersect and relate to their PUBIFRAB may constitute an important direction for future research (Perloff, 2014). Theoretical frameworks rooted in the sociocultural perspective, such as the tripartite model (Thompson et al., 1999), posit that exposure to idealized bodies induces PUBIFRAB because of the underlying influence of two such characteristics, namely appearance-ideal internalization and appearance comparisons. These, as well as the aforementioned motives for, and types of, digital media use, figure prominently in newly elaborated, increasingly integrative models of the digital media use-PUBIFRAB relationship (Filice et al., 2020). Testing these models may contribute to a more complete understanding of these platforms' relation to PUBIFRAB and inform the expansion of existing interventions aiming to attenuate these attitudes and behaviours among both heterosexual and gay men (Brown et al., 2017; Brown & Keel, 2015).

The present study explored men's digital media use in relation to PUBIFRAB in an innovative manner, namely through its focus on various digital platforms, various types of male-centric PUBIFRAB and sexual orientation. Results provide partial support for the sociocultural perspective of body image, as PUBIFRAB were not necessarily more prevalent among SNS users relative to non-users, regardless of sexual orientation. However, our results highlight a potential risk associated with dating app use, particularly among gay men. The observed relationships between gay men's dating app use and eating disorder symptomatology underscore the importance of a more consistent assessment of these symptoms in studies on digital correlates of PUBIFRAB among men, generally, and gay men, specifically. From a practical standpoint, our results provide added support for the contention that gay men should be mindful of the type of content that can be found on dating apps and of its potentially harmful effects (Breslow et al., 2020). As has been suggested elsewhere (Breslow et al., 2020; Yee et al., 2020), app developers should provide users with resources to help mitigate these effects, for example, through the promotion of media literacy (e.g., educating users of the way images may be modified or manipulated) or by providing tips on moderating exposure to potentially harmful content. Moreover, clinicians should be mindful of the ubiquity of dating app use among gay men and of its potentially harmful effects. When pertinent, dating app use should be investigated, potential negative effects should be discussed, and clients should be accompanied as they navigate this online environment (Breslow et al., 2020).

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Table 1

*Demographic Characteristics for Heterosexual and Gay Men*

Characteristics	Total ( <i>n</i> = 382)	Hetero ( <i>n</i> = 261)	Gay ( <i>n</i> = 121)	Group (hetero-gay) differences		
				<i>t</i>	<i>df</i>	<i>p</i> -value
Age [ <i>M</i> ( <i>SD</i> )]	22.69 (2.95)	22.18 (2.79)	23.77 (3.02)	-5.03	380	<.001**
BMI [ <i>M</i> ( <i>SD</i> )]	23.63 (4.08)	23.80 (3.73)	23.26 (4.72)	1.12	193.17	.265
				$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
Race/ethnicity [ <i>n</i> (%)]				3.81	5	.616
White	330 (86.40)	223 (85.40)	107 (88.40)			
Black	9 (2.40)	8 (3.10)	1 (0.80)			
Asian	8 (2.10)	6 (2.30)	2 (1.70)			
Hispanic	7 (1.80)	6 (2.30)	1 (0.80)			
First Nations	1 (0.30)	1 (0.40)	0 (0)			
Other	27 (7.10)	17 (6.50)	10 (8.30)			
Highest education [ <i>n</i> (%)]				28.31	2	<.001**
High school	14 (3.70)	9 (3.50)	5 (4.10)			
Pre-university/ professional degree	195 (51.20)	157 (60.40)	38 (31.40)			
University	172 (45.10)	94 (36.20)	78 (64.50)			
Yearly income [ <i>n</i> (%)]				9.37	3	.024*
\$0 - \$40 000	218 (57.50)	143 (55.00)	75 (63.00)			
\$41 000 - \$80 000	38 (10.00)	21 (8.10)	17 (14.30)			
\$81 000 or more	87 (23.00)	69 (26.50)	18 (15.10)			
Don't know	36 (9.50)	27 (10.40)	9 (7.60)			
Relationship status [ <i>n</i> (%)]				.016	1	.913
Single	207 (54.20)	142 (54.40)	65 (53.70)			
In a relationship	175 (45.80)	119 (45.60)	56 (46.30)			

*Note.* Hetero = heterosexual; *df* = degrees of freedom; BMI = body mass index. Participants' BMI ranged from 17.04 to 43.24 for heterosexual men, and from 16.33 to 40.63 for gay men.

<sup>a</sup>Exact *p*-values are reported for chi-square ( $\chi^2$ ) analyses.

\* *p* < .05. \*\**p* < .01.

Table 2

*Descriptive Information and Sexual Orientation-based Differences for SNS and Dating App Use*

Variables	Facebook			Group (hetero-gay) differences		
	Total ( <i>n</i> = 382)	Hetero ( <i>n</i> = 261)	Gay ( <i>n</i> = 121)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Use				2.03	1	.241
Yes	368 (96.30)	249 (95.40)	119 (98.30)			
No	14 (3.70)	12 (4.60)	2 (1.70)			
Time per day				10.59	3	.014*
Less than one hour	137 (37.20)	103 (41.40)	34 (28.60)			
One hour	122 (33.20)	85 (34.10)	37 (31.10)			
Two hours	66 (17.90)	37 (14.90)	29 (24.40)			
Three hours or more	43 (11.70)	24 (9.60)	19 (16.00)			
	Instagram			Group (hetero-gay) differences		
	Total ( <i>n</i> = 382)	Hetero ( <i>n</i> = 261)	Gay ( <i>n</i> = 121)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Use				6.25	1	.016*
Yes	267 (69.90)	172 (65.90)	95 (78.50)			
No	115 (30.10)	89 (34.10)	26 (21.50)			
Time per day				9.44	3	.023*
Less than one hour	113 (42.50)	81 (47.40)	32 (33.70)			
One hour	80 (30.10)	51 (29.80)	29 (30.50)			
Two hours	48 (18.00)	29 (17.00)	19 (20.00)			
Three hours or more	25 (9.40)	10 (5.80)	15 (15.80)			
	Snapchat			Group (hetero-gay) differences		
	Total ( <i>n</i> = 382)	Hetero ( <i>n</i> = 261)	Gay ( <i>n</i> = 121)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Use				2.39	1	.129
Yes	257 (67.30)	169 (64.80)	88 (72.70)			
No	125 (32.70)	92 (35.20)	33 (27.30)			
Time per day				1.22	3	.774
Less than one hour	203 (79.30)	131 (78.00)	72 (81.80)			
One hour	37 (14.50)	27 (16.10)	10 (11.40)			
Two hours	9 (3.50)	6 (3.60)	3 (3.40)			
Three hours or more	7 (2.70)	4 (2.40)	3 (3.40)			

	Dating apps			Group (hetero-gay) differences		
	Total ( <i>n</i> = 382)	Hetero ( <i>n</i> = 261)	Gay ( <i>n</i> = 121)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Use				28.73	1	<.001**
Yes	121 (31.70)	60 (23.00)	61 (50.40)			
No	261 (68.30)	201 (77.00)	60 (49.60)			
Time per day				10.91	3	.007**
Less than one hour	92 (77.30)	51 (87.90)	41 (67.20)			
One hour	18 (15.10)	7 (12.10)	11 (18.00)			
Two hours	6 (5.00)	0 (0)	6 (9.80)			
Three hours or more	3 (2.50)	0 (0)	3 (4.90)			
Application number				14.90	2	.001**
One	49 (40.80)	33 (55.90)	16 (26.20)			
Two	35 (29.20)	17 (28.80)	18 (29.50)			
Three or more	36 (30.00)	9 (15.30)	27 (44.30)			
Main reason for use				7.96	4	.093
Friendship	10 (8.30)	3 (5.10)	7 (11.50)			
Dating	38 (31.70)	25 (42.40)	13 (21.30)			
Relationship	32 (26.70)	16 (27.10)	16 (26.20)			
Sex	33 (27.50)	12 (20.30)	21 (34.40)			
Other	7 (5.80)	3 (5.10)	4 (6.60)			

Note. SNS = social networking sites; Hetero = heterosexual; *df* = degrees of freedom.

<sup>a</sup>Exact *p*-values are reported for chi-square ( $\chi^2$ ) analyses.

\* *p* < .05. \*\* *p* < .01.

Table 3

*Descriptive Information and Sexual Orientation-based Differences for PUBIFRAB*

Variables	Heterosexual				Gay				Group (hetero-gay) differences			
	n	Range		M (SD)	n	Range		M (SD)	t	df	p-value	Cohen's d <sup>a</sup>
		Potential	Actual			Potential	Actual					
Body fat dissatisfaction	256	5 - 25	5 - 25	10.43 (5.47)	119	5 - 25	5 - 25	13.00 (6.33)	-3.81	203	<.001**	0.45
Muscularity dissatisfaction	257	7 - 35	7 - 35	18.18 (5.81)	119	7 - 35	7 - 35	23.00 (5.97)	-7.42	374	<.001**	0.82
Restraint	245	0 - 6	0 - 6	0.73 (1.10)	114	0 - 6	0 - 5	0.88 (1.12)	-1.23	357	.218	0.14
Eating concern	239	0 - 6	0 - 5.60	0.37 (0.77)	112	0 - 6	0 - 3.40	0.60 (0.78)	-2.56	215.69	.011*	0.30
Shape concern	237	0 - 6	0 - 6	1.16 (1.18)	112	0 - 6	0 - 5.75	2.14 (1.48)	-6.16	179.63	<.001**	0.77
Weight concern	238	0 - 6	0 - 6	0.89 (1.09)	112	0 - 6	0 - 6	1.61 (1.47)	-4.66	170.98	<.001**	0.59
Muscle-building behaviour	212	1 - 6	1 - 5.57	2.01 (1.03)	108	1 - 6	1 - 5.29	1.74 (0.91)	2.36	318	.019*	0.28

Note. PUBIFRAB = potentially unhealthy body image- and food-related attitudes and behaviours; Hetero = heterosexual; *df* = degrees of freedom.

<sup>a</sup>Cohen's *d* was calculated using pooled standard deviations; *d* = 0.2, 0.5, and 0.8 constitute a small, medium, and large effect size, respectively (Cohen, 1988, 1992).

\* *p* < .05. \*\* *p* < .01.

## **Chapter 3: Second Article**

The Role of Muscular-ideal Internalization, Appearance Comparisons, and Sexual Orientation in  
the Relationship of Digital Media Use to Men's Unhealthy Body Image- and Food-related  
Attitudes and Behaviours

Olivier Di Pietrantonio (B.A.)<sup>a</sup>, Dominique Meilleur (Ph. D.)<sup>a</sup>

- a. Adolescence and Eating Disorders Research Laboratory, Department of Psychology,  
University of Montreal, Montreal, Quebec, Canada

## Abstract

Scant attention has been paid to underlying mechanisms of the link between men's use of digital media and potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB). This study investigated whether men's ( $n = 396$ ) use of Facebook, Instagram, Snapchat, and dating applications was associated with body dissatisfaction, eating disorder symptoms, and muscle-building behaviour, and whether these associations were mediated by muscular-ideal internalization and appearance comparisons. Sexual orientation-based variations in these associations were also explored. Results showed a series of positive indirect effects of time spent on each platform on men's PUBIFRAB through the proposed mediators. Moderated mediation analyses provided little evidence that these effects differed between heterosexual and gay men. Results provide insight into intervention targets that may mitigate potentially harmful digital media-related influence.

**Keywords:** Men's body image, digital media, appearance-ideal internalization, appearance comparison, sexual orientation

## Introduction

Potentially unhealthy body image- and food-related attitudes and behaviours (PUBIFRAB; e.g., appearance-related concerns, dietary restriction, binge eating) have been associated with deleterious health outcomes among men, including substance use, depression, and eating disorders (Calzo et al., 2016; Doumit et al., 2018; Mitchison et al., 2014). Thus, a better understanding of PUBIFRAB and their underlying factors appears crucial. The tripartite influence model (Thompson et al., 1999) constitutes a useful theoretical framework to this end (Tiggemann, 2011). This model proposes that PUBIFRAB result from the promotion of body ideals by various sociocultural agents, namely the media, and that this process is mediated by appearance-ideal internalization and appearance comparisons (Girard et al., 2018; Thompson et al., 1999). Specifically, individuals' exposure to cultural body ideals, for example, via media-generated images, leads to the internalization of these ideals as one's personal standard and to comparisons of one's appearance to said ideals (Thompson et al., 1999). Given that body ideals, which are characterized by hyper-slenderness for women and hyper-muscularity for men, are strict, unrealistic, and thus often difficult to attain, individuals will likely fail to live up to them, which may result in PUBIFRAB (Tiggemann, 2011).

In recent years, digital media platforms, such as social networking sites (SNS; e.g., Instagram) and dating applications ("apps"; e.g., Tinder) have surpassed traditional forms of media (e.g., television, magazines) as the most common means of media consumption (Seidenberg et al., 2017). Worldwide, the number of SNS and dating app users has grown from 2.86 billion and 178.5 million in 2017 to 3.6 billion and 196 million in 2020, respectively (Blumritt, 2021; Statista Research Department, 2021b). Users access digital media platforms multiple times per day and



cumulate a daily usage time of up to two hours, on average (Castro & Barrada, 2020; Ryding & Kuss, 2020; Smith & Anderson, 2018). In addition to their ubiquity, a defining characteristic of SNS and dating apps is that the content generated by its users is mainly, if not entirely, image-focused (Fardouly & Vartanian, 2016; Griffiths et al., 2018). Consequently, scholars have proposed that these platforms may exert a strong influence on PUBIFRAB, through the promotion of body ideals (Perloff, 2014). This proposal has garnered empirical support among women and, increasingly, among men (Saiphoo & Vahedi, 2019). The male body ideal, characterized by a lean yet muscular build, is highly prevalent on digital media platforms (Filice et al., 2019; Gültzow et al., 2020). Relatedly, men's use of SNS and dating apps has been associated with higher levels of PUBIFRAB, including body shame (Rodgers et al., 2020), body dissatisfaction and disordered eating (Griffiths et al., 2018), and the use of products such as laxatives, diet pills, and anabolic steroids (Tran et al., 2019).

Incidentally, users of SNS and dating apps tend to present an ideal version of themselves online (e.g., by modifying their images to correspond to body ideals; Burnell et al., 2021; Filice et al., 2019). Moreover, this content is readily and constantly available to users via smartphones (Paulson, 2020). The use of SNS and dating apps may thus provide ample opportunities for users to internalize cultural body ideals, engage in appearance comparisons, and ultimately develop PUBIFRAB (Perloff, 2014). Nevertheless, internalization and comparison processes have rarely been investigated within the context of SNS and dating app use, particularly among men. Yet, men represent a large portion of digital media users (Statista Research Department, 2021a, 2021d). What is more, certain subsets of the male population, namely gay men, may be especially vulnerable to the influence of digital media use (Griffiths et al., 2018). Indeed, gay men have been

found to be particularly susceptible to the appearance-related content that is characteristic of SNS and dating apps (Gigi et al., 2016). Appearance-ideal internalization and appearance comparisons, both of which are more prevalent among gay men than their heterosexual counterparts (Strübel & Petrie, 2020), may contribute to this heightened susceptibility. This remains unstudied.

## **Understanding the media's influence on men's PUBIFRAB**

The media are considered to be the most important purveyors of cultural body ideals (Girard et al., 2018). As it relates to men, the media have promoted increasingly lean and muscular depictions of the male body (Grogan, 2017; Leit et al., 2001). Importantly, several meta-analyses have evidenced that men's exposure to these types of media-generated images is significantly associated with higher rates of PUBIFRAB, such as body dissatisfaction and disordered eating (Barlett et al., 2008; Blond, 2008; Hausenblas et al., 2013). Through the application of the tripartite influence model (Thompson et al., 1999), scholars have come to better understand the mechanisms that underly this influence. Namely, research has shown that perceived appearance pressure from the media contributes to an increase in men's muscular-ideal internalization (Girard et al., 2018; Tylka, 2011) and appearance comparisons (Tylka & Andorka, 2012; Yeung et al., 2021). These factors, in turn, predict increases in various PUBIFRAB, including body fat dissatisfaction, muscularity dissatisfaction, disordered eating, and muscle-building behaviour (Girard et al., 2018; Tylka, 2011). It is worth noting that these studies have focused mainly on traditional media (e.g., television). However, relative to traditional media, the male population has been gravitating towards image-focused digital media platforms in greater numbers (Seidenberg et al., 2017; Tiggemann & Anderberg, 2020). The popularity of these platforms (Smith & Anderson, 2018) and the growing body of evidence indicating that their use is associated with men's PUBIFRAB

(Griffiths et al., 2018) underscore the pertinence of elucidating whether the mechanisms that underly the traditional media use-PUBIFRAB relationship extend to newer forms of media.

## **Appearance-ideal internalization, appearance comparisons, and men's SNS use**

To date, applications of the tripartite influence model within the context of SNS use have focused mainly on female samples. This body of literature tends to support the mediating role of appearance-ideal internalization and appearance comparisons in the relationship between SNS use and outcomes such as self-objectification, body surveillance, physical appearance anxiety, concerns about one's physical appearance, drive for thinness, and body (dis)satisfaction (Fardouly & Vartanian, 2015; Fardouly et al., 2018; Feltman & Szymanski, 2018; Hendrickse et al., 2017; Lee & Lee, 2021; Sherlock & Wagstaff, 2019). When considered in male-centric studies, appearance-ideal internalization and appearance comparisons have mainly been explored as outcomes of SNS use or moderators of the SNS use-PUBIFRAB relationship. This body of literature has yielded mixed findings. A study by Paulson (2020) showed that men exposed to SNS posts featuring the male body ideal engaged in more appearance comparisons than those exposed to neutral posts (e.g., images of cityscapes). Yee et al. (2020) found that exposure to Instagram posts promoting exercise resulted in increases in men's body fat and muscularity dissatisfaction for men who were high on trait appearance comparison. Posts promoting weight loss, on the other hand, prompted increases in muscularity dissatisfaction, but not body fat dissatisfaction, in men high on trait appearance comparison (Yee et al., 2020). A similar study investigating muscular-ideal internalization as a moderator of the effect of men's exposure to the male body ideal on Instagram on appearance dissatisfaction yielded null results (Tiggemann & Anderberg, 2020).

Only a handful of male-centric studies have considered appearance-ideal internalization and appearance comparisons as mediators of the SNS use-PUBIFRAB relationship, as proposed by the tripartite influence model. With few exceptions (Tiggemann & Anderberg, 2020), this research tends to support the mediating role of appearance comparisons, which were found to mediate the positive association between Instagram use and body dissatisfaction (Modica, 2020), as well as the positive association between Facebook use and body shame (Hanna et al., 2017). The mediating role of internalization processes were investigated in a single study (Fatt et al., 2019). These authors demonstrated a positive relationship between the frequency of engagement with Instagram posts promoting exercise and appearance-based motivations to exercise, through muscular-ideal internalization. The frequency of viewing exercise-promoting posts was also positively associated with body dissatisfaction and health-based motivations to exercise, through both muscular-ideal internalization and appearance comparisons (Fatt et al., 2019).

### **Appearance-ideal internalization, appearance comparisons, and men's dating app use**

Dating apps constitute an objectifying online environment in which users commonly self-present in an idealized or even sexualized way to facilitate connections with potential sexual or romantic partners (Filice et al., 2019; Sumter et al., 2017). Unsurprisingly, a small yet convincing body of evidence suggests that men's engagement with these apps promotes appearance-ideal internalization and appearance comparisons (Strübel & Petrie, 2017). These findings stem mainly from qualitative studies of gay men's experiences on these apps. These men attest to frequent unhealthy comparisons to the lean and muscular bodies that dominate the landscape of gay dating apps, and to a sense that they too should adhere to this body type (Filice et al., 2019; Tran et al.,

2020). These testimonies receive added support from a small number of quantitative studies. Among sexual minority men, the number of dating apps used, as well as the frequency of dating app use, were positively associated with appearance-ideal internalization (Breslow et al., 2020). Similarly, Strübel and Petrie (2017) found that male Tinder users, whose sexual orientation was not specified, reported greater levels of appearance-ideal internalization and appearance comparisons than non-users. Altogether, these findings point to the possibility that internalization and comparison processes underly the positive association between men's dating app use and PUBIFRAB, for which there is increasing evidence (Breslow et al., 2020; Griffiths et al., 2018; Tran et al., 2019). Yet, while several authors have alluded to this possibility (Filice et al., 2019; Tran et al., 2020), the tripartite influence model has yet to be applied to men's dating app use.

### **The role of sexual orientation**

Research has consistently demonstrated that PUBIFRAB (e.g., body dissatisfaction, disordered eating) are significantly more prevalent among gay men than heterosexual men (Calzo et al., 2017; Dahlenburg et al., 2020; Frederick & Essayli, 2016; He et al., 2020; Miller & Luk, 2019; Parker & Harriger, 2020). These data are indicative of a potential vulnerability within the former group that merits elucidation (Dahlenburg et al., 2020; Griffiths et al., 2018). Investigations to this end point to the possibility of a greater sociocultural influence among gay men (Parker & Harriger, 2020). Namely, traditional media influences (e.g., television, magazines) were found to be stronger among gay men than among their heterosexual counterparts (Carper et al., 2010; McArdle & Hill, 2009). Reports that this difference is driven by gay men's greater susceptibility to appearance-related content (Gigi et al., 2016) is of particular interest, as this type of content figures prominently on digital media platforms (Fardouly & Vartanian, 2016; Gützow et al.,

2020). Comparative studies have also shown that gay men internalize the male body ideal and engage in appearance comparisons to a greater extent than heterosexual men (Alleva et al., 2018; Gigi et al., 2016; Jankowski et al., 2014; Yean et al., 2013). It is therefore possible that the mechanisms proposed by the tripartite influence model contribute to gay men's susceptibility to appearance-focused media and, by the same token, to higher rates of PUBIFRAB among this group. The effect of digital media on PUBIFRAB, through appearance-ideal internalization and appearance comparisons, may thus be more pronounced among gay men relative to heterosexual men, particularly within the context where the latter group reports a more frequent use of these platforms (Seidenberg et al., 2017; Sumter & Vandenberg, 2019).

### **Current gaps in the literature**

Considering the popularity of SNS and dating apps among men (Seidenberg et al., 2017; Tiggemann & Anderberg, 2020), as well as the cumulation of evidence suggesting that their use of these platforms is positively associated with PUBIFRAB (Paulson, 2020; Tran et al., 2019), a better understanding of the mechanisms that underly this association is needed. While the tripartite influence model provides a valuable theoretical framework through which the nature of the media use-PUBIFRAB relationship can be elucidated, namely through the consideration of internalization and comparison processes (Girard et al., 2018; Tylka, 2011), its application to men's SNS and dating app use is all but absent. In instances where the tripartite influence model has been utilized, there has been a disproportionate focus on appearance comparisons, providing little insight into the role of appearance-ideal internalization. To date, only a single study (Fatt et al., 2019) has considered both mechanisms within the context of digital media use. Furthermore, considering that gay men report more SNS and dating app use (Seidenberg et al., 2017; Sumter &

Vandenbosch, 2019), appearance-ideal internalization and appearance comparisons (Strübel & Petrie, 2020), and PUBIFRAB (Frederick & Essayli, 2016) than heterosexual men, the associations between these variables may be moderated by sexual orientation. This has yet to be investigated. More generally, the proliferation of SNS over the last several years has prompted scholars to call for the inclusion of a variety of platforms in investigations into the potential impact of their use (Fardouly & Vartanian, 2016; Holland & Tiggemann, 2016; Rodgers et al., 2020). To date, however, studies have mainly focused on a single platform or grouped different platforms into a single, undifferentiated category. The use of dating apps, in particular, has been overlooked. Finally, male-centric studies on the digital media use-PUBIFRAB relationship have typically utilized body dissatisfaction as an outcome variable. Conversely, potentially unhealthy behaviours meant to achieve the male body ideal through the reduction of body fat (e.g., food restriction) and the increase of muscle mass (e.g., excessive weight training) have scarcely been studied in relation to men's digital media use, despite being increasingly commonplace (Murray et al., 2020; Murray et al., 2017).

## **The present study**

The present study addressed the aforementioned limitations by testing a cross-sectional model examining potential mechanisms underlying the relationship between the use of various digital media platforms and PUBIFRAB in a sample of men between the ages of 18 and 30, as the high prevalence of SNS and dating app use in this age group (Smith & Anderson, 2018; Statista Research Department, 2021c) suggest that they may be particularly susceptible to its potential negative effects. Specifically, this study aimed to elucidate whether daily usage time of Facebook, Instagram, Snapchat, and dating apps were associated with young men's body dissatisfaction,

eating disorder symptoms, and muscle-building behaviour, and whether these relationships were mediated by muscular-ideal internalization and appearance comparisons. An additional aim of this study was to explore whether these mediation effects were moderated by sexual orientation. It was expected that Facebook, Instagram, Snapchat, and dating app use would be positively correlated with body dissatisfaction, eating disorder symptoms, and muscle building behaviour (H1), that these associations would be mediated by muscular-ideal internalization and appearance comparisons (H2), and that these mediation effects would be stronger for gay men than heterosexual men (H3). The proposed moderated mediation model is displayed in **Figure 1**.

## **Method**

### **Participants**

The sample comprised 396 men ( $n$  heterosexual = 266;  $n$  gay = 130) between the ages of 18 and 30 ( $M = 22.66$ ;  $SD = 2.95$ ). Most participants were white (86.4%) and more than half were single (54%). Regarding participants' education and income level, most reported a post-secondary education (i.e., professional/pre-university degree: 51.9%; university degree: 44.3%) and a household income of \$40 000 or less (57%). The sample's BMI ranged from 16.33 to 43.24 ( $M = 23.59$ ;  $SD = 4.04$ ); this average is within normal bounds (Health Canada, 2021). Sexual orientation-based differences in demographic variables were explored using independent samples t-tests and chi-squared tests. Gay men tended to be older and more educated than heterosexual men, whereas household income tended to be greater among heterosexual men relative to gay men. No other significant differences were observed. Demographic information and group comparisons are presented in **Table 1**.



## Procedure

Participants were recruited on university campuses and online (e.g., via mailing lists, on social media) between January 2018 and January 2021. Individuals were invited to participate in a study on the sociocultural determinants of men's PUBIFRAB, which consisted of completing an online survey hosted by SimpleSurvey.com. Participants who provided informed consent to participate in the study were screened for eligibility via a series of demographic questions. Only cisgender men between the ages of 18 and 30 who identified as exclusively or predominantly heterosexual or homosexual were considered eligible. A total of 541 individuals responded to the informed consent form, including four who responded "no". Of the remaining 537 entries, 141 were removed from the dataset because they did not respond beyond the consent form ( $n = 68$ ), did not meet age-related criteria ( $n = 18$ ), were not cisgender men ( $n = 36$ ), or identified as asexual, bisexual or did not specify their sexual orientation ( $n = 19$ ). This resulted in a final sample size of 396 men. This research project was approved by the University of Montreal's *Comité d'éthique de la recherche en éducation et en psychologie* (CERAS-2017-18-052-P).

## Measures

**Demographics and sexual orientation.** Participants self-reported age, weight, height, racial/ethnic identify, education level, yearly household income, and relationship status. Information pertaining to weight and height was used to determine participants' BMI ( $\text{kg}/\text{m}^2$ ; Health Canada, 2021). The single-item Kinsey Heterosexual-Homosexual Rating Scale (Kinsey et al., 1948) was used to assess sexual orientation. Participants selected the descriptor that was most representative of their sexual orientation using a 7-point rating scale ranging from 0 (*exclusively heterosexual*) to 6 (*exclusively homosexual*), with the midpoint (i.e., 3) being indicative of

bisexuality. An additional category of “X” (*no sexual contacts or reactions*) was also included. Consistent with prior research (Strübel & Petrie, 2020), men who identified as exclusively or predominantly heterosexual (i.e., scores 0-2) were classified as heterosexual, whereas those who identified as predominantly or exclusively homosexual (i.e., scores 4-6) were classified as gay.

**Daily time spent on SNS and dating apps.** To assess daily time spent on SNS and dating apps, participants were first asked to indicate if they used Facebook, Instagram, Snapchat and/or dating apps (i.e., yes/no). Users were then asked to indicate the amount of daily time spent on each platform using a rating scale ranging from 1 (*less than one hour per day*) to 4 (*three hours or more per day*). An additional category of 0 (*no time*) was then created, which included non-users of each platform. Facebook, Instagram, and Snapchat were selected in accordance with reports that these SNS are highly image-centric (Griffiths et al., 2018). Regarding dating apps, those used by gay men tend to be designed specifically for them (Groves et al., 2014), suggesting that there is little overlap between apps used by gay and heterosexual men. Questions pertaining to dating app use thus referred to “dating apps” in general, rather than specific apps.

**Muscular-ideal internalization.** The 4-item Internalization: Muscular subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4-Revised (SATAQ-4R; Schaefer et al., 2017) was used to measure muscular-ideal internalization. Items are rated on a 5-point scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*). Scores were obtained by averaging item responses. Higher scores indicate a greater degree of internalization. This subscale has been validated among college men and sexual minority men and has demonstrated sound reliability in

both cases (Convertino et al., 2019; Schaefer et al., 2017). Cronbach's alpha in the present study was .84 and .87 for heterosexual and gay men, respectively.

**Appearance comparisons.** The Physical Appearance Comparison Scale-Revised (PACS-R; Schaefer & Thompson, 2014) was used to assess men's engagement in appearance comparisons in a variety of contexts (e.g., at work, school, a party). The PACS-R is composed of 11 items rated on a 5-point scale ranging from 0 (*never*) to 4 (*always*). Scores were obtained by averaging item responses. A higher score indicates more frequent comparisons. Although the PACS-R has not been validated in a male sample, it incorporates gender-neutral language (Schaefer & Thompson, 2014) and has demonstrated excellent reliability in male samples (Fatt et al., 2019). Cronbach's alpha in the current sample was .95 for heterosexual and gay men.

**PUBIFRAB.** Considering the centrality of leanness (i.e., absence of body fat) and muscularity to men's body image (Griffiths et al., 2018), the present study operationalized PUBIFRAB as dissatisfaction with these characteristics, as well as behaviours meant to achieve them (i.e., disordered eating, muscle-building behaviour).

**Body dissatisfaction.** The Revised Male Body Attitudes Scale (MBAS-R; Ryan et al., 2011) was used to measure participants' body dissatisfaction. The MBAS-R is composed of 15 items assessing dissatisfaction with body fat, muscularity, and height. Items are rated on a 5-point scale ranging from 1 (*never*) to 5 (*always*). A measure of overall body dissatisfaction was obtained by summing item responses. Higher scores indicate greater levels of dissatisfaction. The MBAS-R has demonstrated sound reliability among the scale development sample and among sexual

minority men (Whitfield et al., 2018). In the present study, Cronbach's alpha for the MBAS-R was .88 and .85 for heterosexual and gay men, respectively.

***Eating disorder symptoms.*** Core behavioural and cognitive eating disorder symptoms were assessed via the French version (Mailloux, 2013) of the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). In addition to being one of the most used measures of eating disorder symptomatology (Lavender et al., 2010), the EDE-Q is a measure for which normative data are available for heterosexual (Lavender et al., 2010) and gay men (Nagata et al., 2020). The EDE-Q comprises 28 items. Six items assess the frequency of various disordered eating behaviours (e.g., binge eating). The remaining 22 items are grouped into four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern. These items are rated using a 7-point scale. Subscale items are averaged to obtain subscale scores and subscale scores are averaged to obtain a total score. Higher scores indicate greater levels of symptomatology. Only the total score was used in the present study. The EDE-Q has demonstrated adequate psychometric properties among undergraduate (Lavender et al., 2010) and gay men (Nagata et al., 2020). Cronbach's alpha in the present study was .85 and .88 for heterosexual and gay men, respectively.

***Muscle-building behaviour.*** Engagement in muscle-building behaviour was assessed using the Muscle-Oriented Behaviour subscale of the Drive for Muscularity scale (DMS-MB; McCreary & Sasse, 2000; McCreary et al., 2004). This subscale is composed of seven items rated on a 6-point scale ranging from 1 (*never*) to 6 (*always*). Item responses were averaged to obtain the subscale score. Higher scores represent a greater drive for muscularity. The DMS-MB has demonstrated adequate psychometric properties within samples of undergraduate (McCreary et al.,

2004) and gay men (DeBlaere & Brewster, 2017). In the present study, Cronbach's alpha was .87 and .89 for heterosexual and gay men, respectively.

**Questionnaire translation.** The SATAQ-4R, PACS-R, MBAS-R and DMS-MB were translated into French for the present study. In accordance with Brislin's (1970) back-translation method, items were translated from English to French by the first author, then blindly translated back to English by a graduate student in clinical psychology. Four raters (i.e., the first and second authors and two graduate students in clinical psychology) then examined the translations for discrepancies. Modifications were made until consensus was achieved. All raters involved in this process were fully bilingual.

## Results

### Descriptive statistics and group comparisons for the variables under study

Descriptive information for participants' digital media use and remaining variables (i.e., muscular-ideal internalization, appearance comparisons, body dissatisfaction, eating disorder symptoms, muscle-building behaviour) is summarized in **Table 2** and **Table 3**, respectively. Sexual orientation-based differences for these variables were explored using chi-squared tests and independent-samples t-tests. For all digital media platforms under study except Snapchat, the proportion of individuals reporting greater daily usage times was significantly greater among gay men than heterosexual men (**Table 2**). Mean levels of appearance comparisons, body dissatisfaction, and disordered eating were also significantly greater among gay men relative to heterosexual men, whereas the inverse pattern emerged for muscle-building behaviour; muscular-ideal internalization was statistically equivalent across groups (**Table 3**).

## **Associations between the variables under study**

The degree and directionality of the association between the study's variables are presented in **Table 4**. Only the associations between digital media usage time and PUBIFRAB are described, in accordance with H1. Time spent on Snapchat was positively associated with muscle-building behaviour among heterosexual men. For gay men, time spent on dating apps was positively associated with body dissatisfaction and eating disorder symptoms. No other significant associations emerged.

## **Mediation model evaluation**

It is possible to test a mediation model in the absence of significant direct relationships between proposed predictor and outcome variables (Hayes, 2009). Therefore, the indirect relationship between each predictor (i.e., daily time spent on Facebook, Instagram, Snapchat, dating apps) and outcome variable (i.e., body dissatisfaction, eating disorder symptoms, muscle-building behaviour), through muscular-ideal internalization and appearance comparisons, was investigated using Model 4 of Hayes' (2018) PROCESS macro for SPSS. PROCESS uses bootstrapping analyses to approximate the sampling distribution of the indirect effect through repeated resampling; the recommended 5000 samples were used (Hayes, 2009). An indirect effect is significant when the associated 95% confidence interval (CI) does not include zero (Hayes, 2009). Multicategorical predictors were treated using indicator coding (Hayes & Preacher, 2014). Models for Instagram, Snapchat and dating apps utilized non-users (i.e., no usage time) as the reference group. Those for Facebook utilized individuals reporting less than one hour of daily use (including non-users) as the reference group, given the small number of Facebook non-users. The

observed indirect effects are presented in **Table 5**; only those that achieved statistical significance are addressed below.

**Facebook.** There was a significant positive indirect effect of time spent on Facebook on both body dissatisfaction and eating disorder symptoms, through increases in appearance comparisons. In both cases, the significant indirect effect was observed for men who spend two hours or more per day on Facebook, relative to those using it for less than one hour per day.

**Instagram.** A significant positive indirect effect of daily time spent on Instagram on body dissatisfaction, through increases in muscular-ideal internalization and appearance comparisons, was observed. Appearance comparisons similarly mediated the positive association between daily time spent on Instagram and disordered eating. In both cases, the significant indirect effects emerged among men spending upwards of three hours per day on Instagram, relative to non-users. Finally, there was a significant positive indirect effect of daily time spent on Instagram on muscle-building behaviour, through increases in muscular-ideal internalization This result was observed for men spending two hours or more per day on Instagram, relative to non-users.

**Snapchat.** There was a significant positive indirect effect of daily time spent on Snapchat on body dissatisfaction, through increases in muscular-ideal internalization and appearance comparisons, for men using this platform for less than one hour per day relative to non-users. Muscular-ideal internalization similarly mediated this relationship for men using Snapchat for one hour per day. There was a significant positive indirect effect of daily time spent on Snapchat on eating disorder symptoms and muscle-building behaviour, through increases in appearance

comparisons and muscular-ideal internalization, respectively. These results were observed for individuals spending no more than one hour per day on Snapchat, relative to non-users.

**Dating apps.** There was a significant positive indirect effect of daily time spent on dating apps on body dissatisfaction, through increases in muscular-ideal internalization and appearance comparisons, for individuals spending upwards of three hours per day on these apps relative to non-users. Muscular-ideal internalization similarly mediated this relationship for men spending two hours per day on dating apps. There was a significant positive indirect effect of daily time spent on dating apps on disordered eating and muscle-building behaviour, through increases in appearance comparisons and muscular-ideal internalization, respectively. These effects were observed for men spending at least two hours per day on dating apps, relative to non-users.

### **Moderated mediation model evaluation**

Sexual orientation was tested as a possible moderator of the indirect effect of muscular-ideal internalization and appearance comparisons on the associations between daily Facebook, Instagram, Snapchat, and dating app usage time and PUBIFRAB (i.e., body dissatisfaction, eating disorder symptoms, muscle-building behaviour). Analyses were conducted using Model 58 in PROCESS for SPSS (Hayes, 2018), which generates an index of moderated mediation indicating whether an indirect effect differs at different values of the moderator (Hayes, 2015). The moderating role of sexual orientation was tested only within significant mediation models, as per prior analyses (H2); where only one of the mediation pathways was significant, the non-significant mediator was included as a covariate. For the purpose of these analyses, men who reported a daily dating app usage time of one hour or more were grouped into a single category to adjust for the



absence of heterosexual men spending two hours or more per day on these apps. Results of the moderated mediation analyses are presented in **Table 6**; only significant indexes of moderated mediation and accompanying indirect effects are addressed below.

There was a significant sexual orientation-based variation in the indirect effect of daily time spent on Snapchat on eating disorder symptoms, through appearance comparisons, for men spending upwards of three hours per day on this platform relative to non-users. An examination of the conditional indirect effect at different levels of the moderator revealed that the effect was not significant for heterosexual men. However, a more frequent daily use of Snapchat exerted a significant negative indirect effect on gay men's eating disorder symptomatology, through appearance comparisons. Despite this significant moderated mediation effect, sexual orientation was not a significant moderator of the relationship between the highest level of daily time spent on Snapchat and appearance comparisons (path a;  $b = -1.25$ ,  $SE = 0.80$ ,  $95\% CI = [-2.83, 0.32]$ ), nor of the relationship between appearance comparisons and eating disorder symptomatology (path b;  $b = 0.08$ ,  $SE = 0.09$ ,  $95\% CI = [-0.10, 0.25]$ ).

The indirect effect of daily time spent on dating apps on body dissatisfaction, through appearance comparisons, also significantly varied across sexual orientations for the most frequent users of these apps, relative to non-users. Again, the indirect effect was not significant for heterosexual men. However, daily time spent on dating apps provoked an increase in gay men's body dissatisfaction, through increases in appearance comparisons. Here too, sexual orientation was not a significant moderator of the relationship between the highest level of daily time spent on dating apps and appearance comparisons (path a;  $b = 0.83$ ,  $SE = 0.46$ ,  $95\% CI = [-0.08, 1.74]$ ),

nor of the relationship between appearance comparisons and body dissatisfaction (path  $b$ ;  $b = -0.41$ ,  $SE = 1.02$ ,  $95\% CI = [-2.42, 1.60]$ ), despite the significant moderated mediation effect.

## Discussion

The present study sought to elucidate the association between men's SNS and dating app use and PUBIFRAB, namely by investigating the potential mediating role of muscular-ideal internalization and appearance comparisons. Whether these associations varied as a function of men's sexual orientation was also explored.

Data provided partial support for direct positive associations between daily Facebook, Instagram, Snapchat, and dating app usage time and body dissatisfaction, eating disorder symptoms, and muscle-building behaviour (H1). Significant positive associations were observed solely between heterosexual men's Snapchat use and muscle-building behaviour, and between gay men's dating app use and body dissatisfaction and disordered eating. Particularities in the use of these platforms might account for these findings. Relative to Facebook and Instagram, Snapchat and dating apps are commonly used to "hookup" by heterosexual and gay men, respectively (Castro & Barrada, 2020; Moran et al., 2018; Utz et al., 2015). Consistently, the exchange of and exposure to sexually explicit photos, which are central elements of online hookup culture (Moran et al., 2018), are prevalent on these platforms (Filice et al., 2019; Yockey et al., 2019). Indeed, an analysis of Snapchat content found that a sizeable portion was sexual in nature (Yockey et al., 2019). Moreover, this type of content is exchanged by up to one third of Snapchat users (Roesner et al., 2014; Utz et al., 2015). Similarly, the use of sexualized photos is commonplace on dating apps used by gay men (Filice et al., 2019). Importantly, men's engagement with this type of content

has been associated with PUBIFRAB (Liong & Cheng, 2019). The finding that heterosexual and gay men's respective use of Snapchat and dating apps is associated with PUBIFRAB may thus stem from the fact that these platforms serve a similar function. Heterosexual and gay men's engagement with these online environments, in which appearance pressure may be especially salient, appears to be linked to PUBIFRAB corresponding to the aspects of the male body ideal they value most, namely muscularity and leanness (i.e., absence of body fat), respectively (Dahlenburg et al., 2020).

As expected, internalization and comparison processes mediated the relationship between daily time spent on SNS and dating apps and PUBIFRAB (H2), whereby greater daily usage times were associated with greater levels of PUBIFRAB, through increases in muscular-ideal internalization and appearance comparisons. Specifically, time spent on most platforms was indirectly related to men's body dissatisfaction through both mediators; Facebook use exerted an indirect effect on body dissatisfaction solely through muscular-ideal internalization. SNS and dating app use were also related to men's muscle-building behaviour and disordered eating through internalization and comparison processes, respectively. These results are consistent with previous findings relating to men's body dissatisfaction (Fatt et al., 2019; Modica, 2020) and motivations to exercise or modify their eating habits (Tiggemann & Anderberg, 2020), while suggesting that internalization and comparison processes underly associations between SNS and dating app use and actual symptoms and behaviours as well.

The above-mentioned indirect associations were, for the most part, observed among the most frequent users of SNS and dating apps (i.e.,  $\geq$  two hours, daily). This is consistent with the

proposal that the influence of digital media on PUBIFRAB results from a cumulative process (Arroyo & Brunner, 2016). Indeed, it appears possible that muscular-ideal internalization and engagement in appearance comparisons are influenced by men's repeated and prolonged use of digital media, thereby influencing to PUBIFRAB over time. While this pattern was observed for most platforms under study (i.e., Facebook, Instagram, dating apps), Snapchat stood out as an exception. Namely, Snapchat's relation to PUBIFRAB, through the proposed mediators, was observed for men who used this platform *least* frequently (i.e.,  $\leq$  one hour, daily). This may be due to the small number of participants who reported using Snapchat upwards of one hour per day ( $n = 17$ ). An alternative explanation might lie in the distinctive features and uses of Snapchat, relative to other online platforms. Snapchat provides a more visual alternative to texting, whereby users communicate through a constant exchange of "selfies" (Burnell et al., 2021). Moreover, Snapchat allows for the application of a variety of "filters" with which users can hide or modify what they deem to be physical imperfections or deviations from prescribed body ideals (Burnell et al., 2021). In this way, users constantly view themselves from an observer's perspective, while being confronted to carefully curated versions of their interlocutors (Burnell et al., 2021; Salomon & Brown, 2021). Appearance norms may thus be particularly salient on Snapchat, which could favour a more rapid activation of internalization and comparison processes (Burnell et al., 2021).

Altogether, the results discussed above appear to temper the suggestion that measures of total exposure time are insufficient to detect a relationship between digital media use and PUBIFRAB (Kim & Chock, 2015). Given the observed direct associations between time spent on Snapchat and dating apps and men's PUBIFRAB, it would seem that the usage time-PUBIFRAB association is directly detectable in the case of platforms with a greater potential to confront users

to potent depictions of body ideals (e.g., sexualized images) or to the belief that they fall short of these ideals (i.e., through the provision of filters). For platforms where this may be less common (i.e., Facebook, Instagram), the usage time-PUBIFRAB association may be less evident, but nevertheless detectable when mediating mechanisms, namely muscular-ideal internalization and appearance comparisons, are considered. A similar notion seems to apply to the indirect effect of internalization and comparison processes. Indeed, the observation of these effects among men who report spending no more than one hour per day on Snapchat suggests that relatively little engagement with digital environments that emphasize appearance-related expectations may be sufficient to increase muscular-ideal internalization and appearance comparisons.

Men's sexual orientation was explored as a potential moderator of the mediating effect of muscular-ideal internalization and appearance comparisons on the relationship between time spent on SNS and dating apps and body dissatisfaction, disordered eating, and muscle-building behaviour. Counter to expectations, the data provided little support for stronger indirect effects among gay men relative to heterosexual men (H3). Only two indexes of moderated mediation were significant. Namely, appearance comparisons were a significant mediator of the relationship between daily time spent on dating apps and body dissatisfaction and between daily time spent on Snapchat and eating disorder symptoms for gay men who use these apps most frequently, but not heterosexual men. The latter pathway was associated with a decrease, rather than an increase, in symptoms. However, in both cases, sexual orientation did not moderate the association between platform use and appearance comparisons (path a), nor did it moderate the association between appearance comparisons and the outcome variable (path b). Accordingly, the possibility that the significant results stem from Type 1 error introduced by the multiplicity of analyses inherent to

the testing of moderated mediation models cannot be ruled out. Thus, while these findings hint at the existence of sexual-orientation specific pathways linking certain digital media platforms (i.e., dating apps) to PUBIFRAB, they should be interpreted with caution.

In accordance with previous research (Castro & Barrada, 2020; Dahlenburg et al., 2020; Parker & Harriger, 2020; Seidenberg et al., 2017), the present study demonstrated that digital media use (i.e., SNS, dating apps) and PUBIFRAB (i.e., body dissatisfaction, disordered eating) are generally more prevalent among gay men than heterosexual men. Nevertheless, with the potential exception of dating apps, this more frequent use of digital media does not seem to account for sexual-orientation-based differences in PUBIFRAB prevalence, either directly or through internalization and comparison processes. This contradicts evidence for gay men's greater susceptibility to appearance-focused media content, which features prominently on the digital media platforms considered in this study (Filice et al., 2019; Gigi et al., 2016; Gültzow et al., 2020). However, susceptibility research has focused on traditional forms of media. Traditional media catering to, and consumed by, gay men, relative to heterosexual men, promote a stricter body ideal (Lanzieri & Cook, 2013). While it is known that the depiction of the male body ideal is pervasive in digital media (Gültzow et al., 2020), it is unclear whether the sexual orientation-based differences in content observed in traditional media extend to online environments. Given that the male population, as a whole, embraces digital media in greater numbers than traditional media (Seidenberg et al., 2017; Tiggemann & Anderberg, 2020), it is possible that heterosexual men are experiencing increasing sociocultural demands in a way that has them "catching up" to their gay counterparts (Mitchison et al., 2014). The fact that heterosexual and gay participants did not differ with respect to muscular-ideal internalization seems consistent with this claim. While

beyond the scope of the present study, the possibility that gay men's "offline" experiences account for the observed sexual orientation-based differences in PUBIFRAB cannot be discounted. For example, stigmatization resulting from one's sexual minority status, as well as participation in the gay community, which has been found to accord particular importance to appearance ideals, have both been associated with gay men's body image and eating concerns (Brennan et al., 2012; Davids et al., 2015; Kimmel & Mahalik, 2005; Siever, 1994).

### **Limitations and future directions**

The present study is not without limitations. First, the sample under study was homogenous in terms of age and gender identity and limited in terms of ethnic/racial diversity, which may limit the generalizability of results. The utilization of more diverse samples may create opportunities for researchers to develop a more global understanding of the digital media use-PUBIFRAB association. Second, data were self-reported and relied on participant recall. This may have resulted in certain inaccuracies in the data, namely those relating to digital media use. The use of readily accessible smartphone activity tracking software may represent a means through which this issue can be addressed in future research. Relatedly, there were certain disparities between groups of users and non-users of certain platforms under study (e.g., Facebook), as well as between groups of less and more frequent users of certain platforms (e.g., Snapchat, dating apps). In some cases, this may have limited the capacity to carry out efficient comparisons and limited analyses' statistical power. Future studies should utilize diverse recruitment methods to optimize sample diversity as it pertains to SNS and dating app user status and usage time, as this may favor a more comprehensive understanding of the impacts of men's use of these platforms.

An additional limitation lies in the nature of the methods employed to test mediation and moderated mediation. While these provided important preliminary insight into the mechanisms that may underly and act upon the association between men's digital media use and PUBIFRAB, the simultaneous exploration of the role of muscular-ideal internalization, appearance comparisons, and sexual orientation in the relationship between various digital media influences and PUBIFRAB within a single, more complex model may provide a more comprehensive and nuanced understanding of whether and how these constructs relate one another. In a related manner, while theory (Thompson et al., 1999) would dictate that digital media use activates internalization and comparisons processes, which in turn lead to PUBIFRAB, the cross-sectional nature of the present study precludes any such conclusion. Longitudinal studies are needed to further elucidate how the above-mentioned variables relate to one another through time.

The way in which SNS and dating app use were assessed may also be considered as a limitation. The use of a continuous measure of usage time may have allowed for greater variability within the data, thereby increasing the capacity of detecting significant associations. Moreover, while measures of usage time provide important insight into potential associations between digital media use and PUBIFRAB, they do not provide a nuanced understanding of this association (Kim & Chock, 2015). Factors such as the features (e.g., filters, content) and uses (e.g., engagement in photo-based activities) of these platforms have garnered increasing attention and their consideration may prove to be informative (Burnell et al., 2021; Holland & Tiggemann, 2016). Similarly, while the present study focused on internalization and comparison processes, additional individual factors, such as one's motivation for using digital media, may underly the associations between the use of these platforms and PUBIFRAB (Filice et al., 2020; Flannery et al., 2020;



Perloff, 2014). Although assumptions as to the potential role of the above-mentioned factors in the digital media use-PUBIFRAB relationship can be drawn from the results of the present study, future research is needed. Finally, caution is warranted when interpreting the results, as they may have been subject to type 1 error due to test multiplicity. Further research is warranted to replicate the present findings.

Despite its limitations, this study contributes to a deeper understanding of men's experience of PUBIFRAB as it relates to their use of a variety of popular image-centric digital media platforms. In addition to providing added support for the application of the tripartite influence model to men's SNS use, this study is the first to apply this model to their use of dating apps. In this way, the present study highlights the role of muscular-ideal internalization and appearance comparisons as important mediators of the association between Facebook, Instagram, Snapchat, and dating app use and PUBIFRAB, particularly among most frequent users, all the while suggesting that the use of the latter two platforms may be particularly unfavourable. To the best of the authors' knowledge, this was also the first study to consider potential sexual orientation-based variations in the digital media use-PUBIFRAB relationship among men. While this allowed for the identification of potential sexual-orientation specific pathways relating the use of certain digital media platforms, namely dating apps, to PUBIFRAB, these results remain inconclusive and merit replication.

Finally, this study's findings point to a number of practical implications with the potential to attenuate the burden of PUBIFRAB among men. Most evidently, men may benefit from limiting their use of SNS and dating apps, particularly as the effect of these platforms seems most evident

after prolonged use. The observation of a mediating role of internalization and comparison processes across platforms that was, for the most part, equivalent among heterosexual and gay men suggests that these processes may constitute effective targets for widely applicable prevention strategies aimed at young adult men within the general population. Media literacy programs, for example, aim to disrupt the pathway from media exposure to appearance-ideal internalization and appearance comparisons by teaching individuals to challenge and propose alternatives to the strict body ideals promoted by the media (McLean et al., 2016; Wade et al., 2017). The current findings highlight the pertinence of expanding these programs, which have typically targeted females and addressed traditional media influences (Gordon et al., 2020; McLean et al., 2016), to include male-targeted content relating to SNS and dating apps use.

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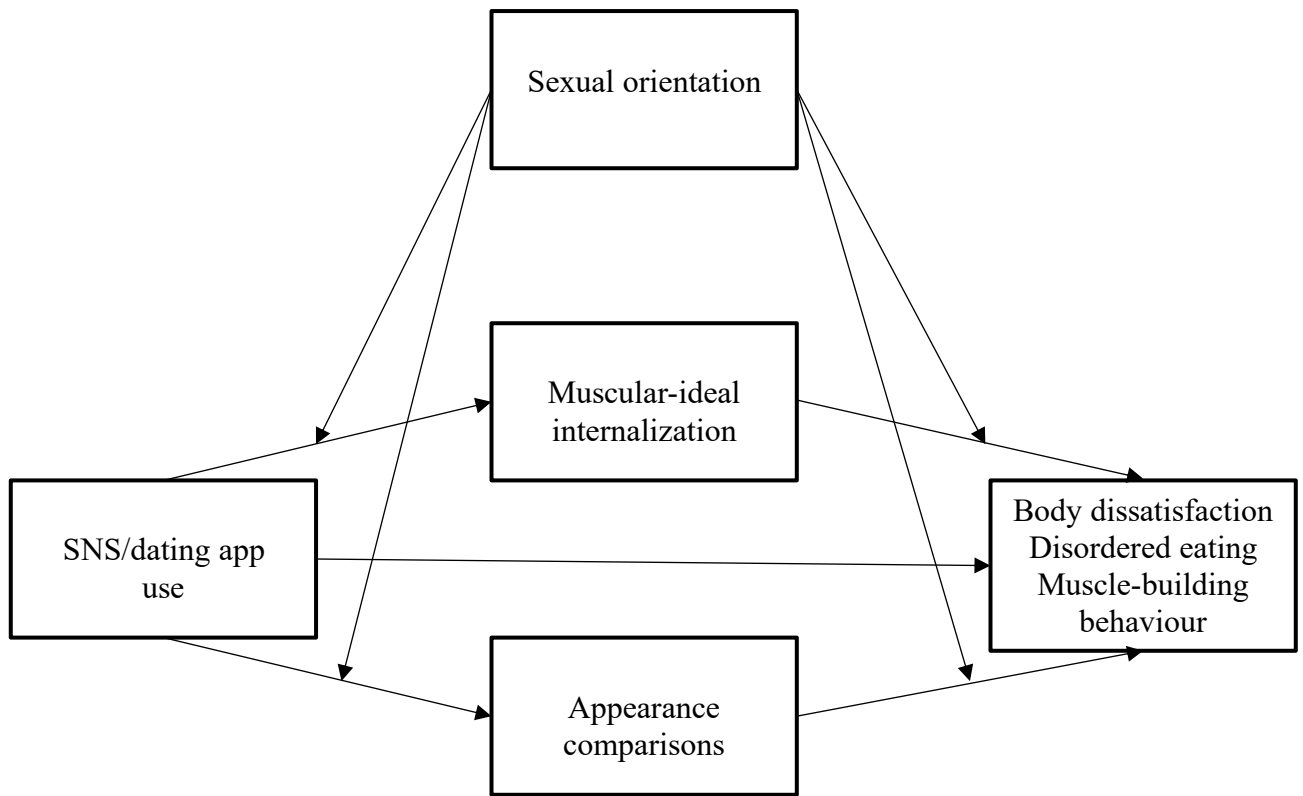


Figure 1. Proposed moderated mediation model. SNS = social networking site.

Table 1

*Demographic Characteristics of the Sample*

Characteristic	Total ( <i>n</i> = 396)	Hetero ( <i>n</i> = 266)	Gay ( <i>n</i> = 130)	Group (hetero-gay) differences		
				<i>t</i>	<i>df</i>	<i>p</i> -value
Age [ <i>M</i> ( <i>SD</i> )]	22.66 (2.95)	22.20 (2.82)	23.60 (3.01)	-4.55	394	<.001**
BMI [ <i>M</i> ( <i>SD</i> )]	23.59 (4.04)	23.79 (3.71)	23.18 (4.63)	1.30	213.45	.193
				$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
Race/ethnicity [ <i>n</i> (%)]				3.95	5	.592
White	342 (86.40)	226 (85.00)	116 (89.20)			
Black	9 (2.30)	8 (3.00)	1 (0.80)			
Asian	8 (2.00)	6 (2.30)	2 (1.50)			
Hispanic	7 (1.80)	6 (2.30)	1 (0.80)			
First Nations	1 (0.30)	1 (0.40)	0 (0)			
Other	29 (7.30)	19 (7.10)	10 (7.70)			
Highest education [ <i>n</i> (%)]				25.50	2	<.001**
High school	15 (3.80)	9 (3.40)	6 (4.60)			
Pre-university/ professional degree	205 (51.90)	161 (60.80)	44 (33.80)			
University	175 (44.30)	95 (35.80)	80 (61.50)			
Yearly income [ <i>n</i> (%)]				8.67	3	.033*
\$0 - \$40 000	224 (57.00)	145 (54.70)	79 (61.70)			
\$41 000 - \$80 000	39 (9.90)	21 (7.90)	18 (14.10)			
\$81 000 or more	92 (23.40)	71 (26.80)	21 (16.40)			
Don't know	38 (9.70)	28 (10.60)	10 (7.80)			
Relationship status [ <i>n</i> (%)]				0.003	1	1.000
Single	214 (54.00)	144 (54.10)	70 (53.80)			
In a relationship	182 (46.00)	122 (45.90)	60 (46.20)			

*Note.* Hetero = heterosexual; *df* = degrees of freedom. BMI = body mass index. Participants' BMI ranged from

17.04 to 43.24 for heterosexual men, and from 16.33 to 40.63 for gay men.

<sup>a</sup>Exact *p*-values are reported for chi-square ( $\chi^2$ ) analyses.

\* *p* < .05. \*\**p* < .01.

Table 2

*Descriptive Information and Sexual Orientation-based Differences for SNS and Dating App Use*

Variable	Facebook			Group (hetero-gay) differences		
	Total ( <i>n</i> = 396)	Hetero ( <i>n</i> = 266)	Gay ( <i>n</i> = 130)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Time per day				10.51	4	.032*
No time (non-user)	17 (4.30)	13 (4.90)	4 (3.10)			
Less than one hour	145 (36.60)	107 (40.20)	38 (29.20)			
One hour	124 (31.30)	85 (32.00)	39 (30.00)			
Two hours	67 (16.90)	37 (13.90)	30 (23.10)			
Three hours or more	43 (10.90)	24 (9.00)	19 (14.60)			
	Instagram			Group (hetero-gay) differences		
	Total ( <i>n</i> = 395)	Hetero ( <i>n</i> = 265)	Gay ( <i>n</i> = 130)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Time per day				16.81	4	.002**
No time (non-user)	119 (30.10)	91 (34.30)	28 (21.50)			
Less than one hour	117 (29.60)	82 (30.90)	35 (26.90)			
One hour	81 (20.50)	51 (19.20)	30 (23.10)			
Two hours	52 (13.20)	31 (11.70)	21 (16.20)			
Three hours or more	26 (6.60)	10 (3.80)	16 (12.30)			
	Snapchat			Group (hetero-gay) differences		
	Total ( <i>n</i> = 395)	Hetero ( <i>n</i> = 265)	Gay ( <i>n</i> = 130)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Time per day				3.71	4	.455
No time (non-user)	130 (32.90)	95 (35.80)	35 (26.90)			
Less than one hour	208 (52.70)	132 (49.80)	76 (58.50)			
One hour	40 (10.10)	27 (10.20)	13 (10.00)			
Two hours	10 (2.50)	7 (2.60)	3 (2.30)			
Three hours or more	7 (1.80)	4 (1.50)	3 (2.30)			
	Dating apps			Group (hetero-gay) differences		
	Total ( <i>n</i> = 394)	Hetero ( <i>n</i> = 264)	Gay ( <i>n</i> = 130)	$\chi^2$	<i>df</i>	<i>p</i> -value <sup>a</sup>
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			
Time per day				40.94	4	<.001**
No time (non-user)	271 (68.80)	205 (77.70)	66 (50.80)			
Less than one hour	94 (23.90)	51 (19.30)	43 (33.10)			

One hour	20 (5.10)	8 (3.00)	12 (9.20)
Two hours	6 (1.50)	0 (0)	6 (4.60)
Three hours or more	3 (0.80)	0 (0)	3 (2.30)

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Note. SNS = social networking site; Hetero = heterosexual; *df* = degrees of freedom.

<sup>a</sup>Exact p-values are reported for chi-square ( $\chi^2$ ) analyses.

\*  $p < .05$ . \*\*  $p < .01$ .

Table 3

*Descriptive Information and Sexual Orientation-based Differences for Muscular-ideal Internalization, Appearance Comparisons, and PUBIFRAB*

Variable	Heterosexual				Gay				Group (hetero-gay) differences			
	<i>n</i>	Range		<i>M</i> ( <i>SD</i> )	<i>n</i>	Range		<i>M</i> ( <i>SD</i> )	<i>t</i>	<i>df</i>	<i>p</i> -value	Cohen's <i>d</i> <sup>a</sup>
		Potential	Actual			Potential	Actual					
Muscular-ideal internalization	208	1 - 5	1 - 5	3.20 (0.94)	113	1 - 5	1 - 5	3.38 (0.98)	-1.65	319	.100	0.19
Appearance comparison	203	0 - 4	0 - 4	1.20 (0.95)	112	0 - 4	0.09 - 4	1.90 (1.05)	-6.00	313	<.001**	0.71
Body dissatisfaction	261	15 - 75	16 - 63	34.17 (10.50)	127	15 - 75	18 - 64	41.46 (10.61)	-6.40	386	<.001**	0.69
Eating disorder symptoms	241	0 - 6	0 - 5.20	0.78 (0.86)	120	0 - 6	0 - 4.26	1.34 (1.07)	-4.96	199.08	<.001*	0.60
Muscle-oriented behaviour	216	1 - 6	1 - 5.57	2.02 (1.02)	116	1 - 6	1 - 5.29	1.77 (0.96)	2.18	330	.030*	0.25

Note. PUBIFRAB = potentially unhealthy body image- and food-related attitudes and behaviours; Hetero = heterosexual; *df* = degrees of freedom.

<sup>a</sup>Cohen's *d* is calculated using pooled standard deviations; *d* = 0.2, 0.5, and 0.8 constitute a small, medium, and large effect size, respectively (Cohen, 1988, 1992).

\* *p* < .05. \*\* *p* < .01.



Table 4

*Intercorrelations between Study Variables for Heterosexual and Gay Men*

Variables	1 <sup>a</sup>	2 <sup>a</sup>	3 <sup>a</sup>	4 <sup>a</sup>	5	6	7	8	9
1. Facebook time <sup>a</sup>	–	.161**	.087	.101	-.005	.088	.081	.055	-.020
2. Instagram time <sup>a</sup>	.226**	–	.512**	.167**	.092	.080	.108	.025	.125
3. Snapchat time <sup>a</sup>	.003	.380**	–	.115	.174*	.128	.115	.072	.204**
4. Dating app time <sup>a</sup>	.007	.156	.001	–	.004	-.048	.012	-.041	-.029
5. Muscular-ideal internalization	-.055	.178	.029	.199*	–	.550**	.505**	.381**	.624**
6. Appearance comparison	.143	.090	-.023	.183	.434**	–	.648**	.616**	.455**
7. Body dissatisfaction	.067	.123	.035	.243**	.536**	.673**	–	.744**	.432**
8. Eating disorder symptoms	.095	.059	.000	.234*	.305**	.612**	.761**	–	.414**
9. Muscle-oriented behaviour	-.211*	.087	-.022	.146	.483**	.201*	.059	.047	–

*Note.* Time variables represent daily usage time. Intercorrelations for heterosexual men ( $n = 202-266$ ) are presented above the diagonal, and intercorrelations for gay men ( $n = 112-130$ ) are presented below the diagonal.  $r = 0.1, 0.3,$  and  $0.5$  constitute a small, medium, and large correlation, respectively (Cohen, 1992).

<sup>a</sup>Associations with daily usage time variables were explored using Spearman's rho correlations, given the ordinal nature of these variables. All remaining associations were conducted using Pearson's correlations.

\*  $p < .05$ . \*\*  $p < .01$ .

Table 5

*Indirect Effects of Muscular-ideal Internalization and Appearance Comparisons*

	Criterion					
	Body dissatisfaction		Eating disorder symptoms		Muscle-oriented behaviour	
Predictor: Facebook time	<i>b</i> ( <i>SE</i> )	95% <i>CI</i>	<i>b</i> ( <i>SE</i> )	95% <i>CI</i>	<i>b</i> ( <i>SE</i> )	95% <i>CI</i>
1 hour x Muscular-ideal internalization	-0.27 (0.33)	[-0.96, 0.34]	-0.004 (0.01)	[-0.03, 0.02]	-0.06 (0.07)	[-0.20, 0.07]
2 hours x Muscular-ideal internalization	0.03 (0.46)	[-0.90, 0.94]	0.0002 (0.01)	[-0.02, 0.03]	0.01 (0.10)	[-0.18, 0.20]
≥ 3 hours x Muscular-ideal internalization	-0.02 (0.43)	[-0.91, 0.81]	-0.001 (0.01)	[-0.03, 0.03]	-0.004 (0.09)	[-0.19, 0.18]
1 hour x Appearance comparison	-0.06 (0.80)	[-1.72, 1.47]	-0.01 (0.08)	[-0.16, 0.14]	-0.001 (0.01)	[-0.03, 0.02]
2 hours x Appearance comparison	<b>3.62 (1.15)</b>	<b>[1.41, 5.93]</b>	<b>0.35 (0.12)</b>	<b>[0.12, 0.59]</b>	0.03 (0.04)	[-0.03, 0.11]
≥ 3 hours x Appearance comparison	<b>2.35 (1.20)</b>	<b>[0.05, 4.72]</b>	<b>0.23 (0.12)</b>	<b>[0.004, 0.48]</b>	0.02 (0.03)	[-0.02, 0.09]
Predictor: Instagram time						
< 1 hour x Muscular-ideal internalization	0.06 (0.33)	[-0.55, 0.76]	0.001 (0.01)	[-0.02, 0.03]	0.01 (0.08)	[-0.14, 0.16]
1 hour x Muscular-ideal internalization	0.21 (0.40)	[-0.58, 1.05]	0.003 (0.01)	[-0.02, 0.04]	0.05 (0.09)	[-0.13, 0.24]
2 hours x Muscular-ideal internalization	0.74 (0.42)	[-0.03, 1.65]	0.01 (0.02)	[-0.03, 0.06]	<b>0.18 (0.09)</b>	<b>[0.003, 0.36]</b>
≥ 3 hours x Muscular-ideal internalization	<b>1.49 (0.60)</b>	<b>[0.44, 2.74]</b>	0.02 (0.04)	[-0.06, 0.11]	<b>0.36 (0.12)</b>	<b>[0.12, 0.60]</b>
< 1 hour x Appearance comparison	0.25 (0.87)	[-1.47, 2.02]	0.03 (0.08)	[-0.13, 0.20]	0.001 (0.01)	[-0.02, 0.02]
1 hour x Appearance comparison	0.96 (1.16)	[-1.18, 3.20]	0.09 (0.11)	[-0.12, 0.33]	0.005 (0.02)	[-0.02, 0.04]
2 hours x Appearance comparison	2.00 (1.21)	[-0.37, 4.33]	0.20 (0.12)	[-0.04, 0.44]	0.01 (0.02)	[-0.03, 0.07]
≥ 3 hours x Appearance comparison	<b>4.41 (1.68)</b>	<b>[1.13, 7.75]</b>	<b>0.43 (0.17)</b>	<b>[0.11, 0.78]</b>	0.02 (0.05)	[-0.06, 0.12]
Predictor: Snapchat time						
< 1 hour x Muscular-ideal internalization	<b>0.63 (0.32)</b>	<b>[0.07, 1.33]</b>	0.01 (0.02)	[-0.03, 0.05]	<b>0.14 (0.07)</b>	<b>[0.01, 0.28]</b>
1 hour x Muscular-ideal internalization	<b>0.89 (0.47)</b>	<b>[0.03, 1.89]</b>	0.01 (0.03)	[-0.04, 0.07]	<b>0.20 (0.10)</b>	<b>[0.005, 0.40]</b>
2 hours x Muscular-ideal internalization	1.44 (0.85)	[-0.12, 3.32]	0.02 (0.04)	[-0.06, 0.12]	0.33 (0.18)	[-0.03, 0.71]
≥ 3 hours x Muscular-ideal internalization	1.28 (1.19)	[-0.97, 3.92]	0.02 (0.05)	[-0.06, 0.14]	0.29 (0.25)	[-0.20, 0.81]
< 1 hour x Appearance comparison	<b>1.77 (0.80)</b>	<b>[0.20, 3.41]</b>	<b>0.17 (0.08)</b>	<b>[0.02, 0.33]</b>	0.01 (0.02)	[-0.02, 0.05]
1 hour x Appearance comparison	0.65 (1.21)	[-1.72, 3.15]	0.06 (0.12)	[-0.16, 0.30]	0.004 (0.01)	[-0.02, 0.04]
2 hours x Appearance comparison	3.68 (2.75)	[-1.17, 9.70]	0.35 (0.26)	[-0.11, 0.93]	0.02 (0.04)	[-0.04, 0.13]
≥ 3 hours x Appearance comparison	1.48 (3.11)	[-4.52, 8.10]	0.14 (0.29)	[-0.42, 0.77]	0.01 (0.03)	[-0.05, 0.09]
Predictor: Dating app time						
< 1 hour x Muscular-ideal internalization	0.09 (0.32)	[-0.59, 0.69]	0.001 (0.01)	[-0.02, 0.02]	0.02 (0.07)	[-0.12, 0.17]

1 hour x Muscular-ideal internalization	0.31 (0.68)	[-1.15, 1.53]	0.005 (0.02)	[-0.04, 0.06]	0.07 (0.15)	[-0.24, 0.36]
2 hours x Muscular-ideal internalization	<b>2.48 (1.21)</b>	<b>[0.18, 5.08]</b>	0.04 (0.07)	[-0.09, 0.21]	<b>0.57 (0.24)</b>	<b>[0.03, 1.02]</b>
≥ 3 hours x Muscular-ideal internalization	<b>2.89 (1.24)</b>	<b>[0.52, 5.31]</b>	0.05 (0.08)	[-0.11, 0.22]	<b>0.66 (0.25)</b>	<b>[0.13, 1.07]</b>
< 1 hour x Appearance comparison	0.82 (0.91)	[-0.90, 2.68]	0.08 (0.09)	[-0.09, 0.25]	0.002 (0.01)	[-0.02, 0.03]
1 hour x Appearance comparison	2.42 (1.67)	[-0.76, 5.77]	0.23 (0.16)	[-0.10, 0.55]	0.01 (0.03)	[-0.05, 0.07]
2 hours x Appearance comparison	4.20 (2.63)	[-1.30, 8.95]	0.40 (0.26)	[-0.13, 0.87]	0.01 (0.05)	[-0.08, 0.12]
≥ 3 hours x Appearance comparison	<b>12.08 (2.53)</b>	<b>[6.79, 16.32]</b>	<b>1.16 (0.25)</b>	<b>[0.63, 1.60]</b>	0.03 (0.11)	[-0.20, 0.26]

*Note.* Time variables represent daily usage time. Multicategorical predictors were treated using indicator coding (Hayes & Preacher, 2014); non-users (i.e., no usage time) served as the reference group in analyses for Instagram, Snapchat, and dating apps; individuals reporting less than one hour of daily use (including non-users) served as the reference group in analyses for Facebook. Analysis sample sizes ranged from n = 313 (Eating disorder symptoms) to 315 (Body dissatisfaction). Significant interaction effects are in bold. CI = bootstrap 95% confidence interval (5000 samples).

Table 6

*Moderation of Sexual Orientation on the Indirect Effects of Muscular-ideal Internalization and Appearance Comparisons*

	Criterion					
	Body dissatisfaction		Eating disorder symptoms		Muscle-oriented behaviour	
Predictor: Facebook time	<i>b (SE)</i>	<i>95% CI</i>	<i>b (SE)</i>	<i>95% CI</i>	<i>b (SE)</i>	<i>95% CI</i>
1 hour x Muscular-ideal internalization (H)						
1 hour x Muscular-ideal internalization (G)						
Index of moderated mediation						
2 hours x Muscular-ideal internalization (H)						
2 hours x Muscular-ideal internalization (G)						
Index of moderated mediation						
≥ 3 hours x Muscular-ideal internalization (H)						
≥ 3 hours x Muscular-ideal internalization (G)						
Index of moderated mediation						
1 hour x Appearance Comparison (H)	0.04 (0.68) <sup>a</sup>	[-1.34, 1.38] <sup>a</sup>	0.002 (0.07) <sup>a</sup>	[-0.13, 0.14] <sup>a</sup>		
1 hour x Appearance Comparison (G)	0.61 (1.19) <sup>a</sup>	[-1.74, 2.99] <sup>a</sup>	0.07 (0.13) <sup>a</sup>	[-0.19, 0.32] <sup>a</sup>		
Index of moderated mediation	0.57 (1.37) <sup>a</sup>	[-2.08, 3.34] <sup>a</sup>	0.06 (0.14) <sup>a</sup>	[-0.22, 0.34] <sup>a</sup>		
2 hours x Appearance Comparison (H)	1.40 (1.02) <sup>a</sup>	[-0.52, 3.52] <sup>a</sup>	0.14 (0.10) <sup>a</sup>	[-0.05, 0.35] <sup>a</sup>		
2 hours x Appearance Comparison (G)	4.05 (1.34) <sup>a</sup>	[1.54, 6.87] <sup>a</sup>	0.44 (0.16) <sup>a</sup>	[0.15, 0.77] <sup>a</sup>		
Index of moderated mediation	2.66 (1.69) <sup>a</sup>	[-0.65, 6.03] <sup>a</sup>	0.31 (0.18) <sup>a</sup>	[-0.04, 0.67] <sup>a</sup>		
≥ 3 hours x Appearance Comparison (H)	2.25 (1.32) <sup>a</sup>	[-0.07, 5.07] <sup>a</sup>	0.22 (0.14) <sup>a</sup>	[-0.01, 0.52] <sup>a</sup>		
≥ 3 hours x Appearance Comparison (G)	1.06 (1.56) <sup>a</sup>	[-2.10, 4.18] <sup>a</sup>	0.12 (0.17) <sup>a</sup>	[-0.21, 0.45] <sup>a</sup>		
Index of moderated mediation	-1.19 (2.03) <sup>a</sup>	[-5.28, 2.78] <sup>a</sup>	-0.11 (0.22) <sup>a</sup>	[-0.56, 0.31] <sup>a</sup>		
Predictor: Instagram time						
< 1 hour x Muscular-ideal internalization (H)	0.33 (0.38)	[-0.30, 1.21]			0.07 (0.08) <sup>b</sup>	[-0.09, 0.24] <sup>b</sup>
< 1 hour x Muscular-ideal internalization (G)	-0.97 (0.84)	[-2.72, 0.64]			-0.10 (0.11) <sup>b</sup>	[-0.32, 0.12] <sup>b</sup>
Index of moderated mediation	-1.30 (0.92)	[-3.24, 0.43]			-0.17 (0.14) <sup>b</sup>	[-0.44, 0.10] <sup>b</sup>
1 hour x Muscular-ideal internalization (H)	0.09 (0.48)	[-0.88, 1.11]			-0.02 (0.10) <sup>b</sup>	[-0.23, 0.19] <sup>b</sup>
1 hour x Muscular-ideal internalization (G)	0.16 (0.83)	[-1.50, 1.80]			0.05 (0.10) <sup>b</sup>	[-0.13, 0.25] <sup>b</sup>
Index of moderated mediation	0.07 (0.94)	[-1.80, 1.94]			0.07 (0.14) <sup>b</sup>	[-0.20, 0.35] <sup>b</sup>
2 hours x Muscular-ideal internalization (H)	0.75 (0.49)	[-0.03, 1.83]			0.15 (0.10) <sup>b</sup>	[-0.04, 0.34] <sup>b</sup>

2 hours x Muscular-ideal internalization (G)	0.45 (0.89)	[-1.29, 2.25]			0.06 (0.12) <sup>b</sup>	[-0.18, 0.29] <sup>b</sup>
Index of moderated mediation	-0.30 (1.01)	[-2.32, 1.70]			-0.09 (0.15) <sup>b</sup>	[-0.39, 0.21] <sup>b</sup>
≥ 3 hours x Muscular-ideal internalization (H)	0.77 (0.96)	[-1.09, 2.80]			0.10 (0.19) <sup>b</sup>	[-0.26, 0.47] <sup>b</sup>
≥ 3 hours x Muscular-ideal internalization (G)	1.90 (0.99)	[0.22, 4.12]			0.18 (0.11) <sup>b</sup>	[-0.02, 0.41] <sup>b</sup>
Index of moderated mediation	1.14 (1.39)	[-1.49, 4.01]			0.08 (0.22) <sup>b</sup>	[-0.37, 0.51] <sup>b</sup>
< 1 hour x Appearance Comparison (H)	0.46 (0.87)	[-1.18, 2.27]	0.002 (0.07) <sup>a</sup>	[-0.13, 0.15] <sup>a</sup>		
< 1 hour x Appearance Comparison (G)	-0.98 (1.61)	[-4.17, 2.15]	-0.01 (0.17) <sup>a</sup>	[-0.34, 0.35] <sup>a</sup>		
Index of moderated mediation	-1.44 (1.83)	[-5.03, 2.08]	-0.01 (0.19) <sup>a</sup>	[-0.38, 0.37] <sup>a</sup>		
1 hour x Appearance Comparison (H)	0.95 (1.35)	[-1.52, 3.83]	0.08 (0.10) <sup>a</sup>	[-0.10, 0.31] <sup>a</sup>		
1 hour x Appearance Comparison (G)	-0.80 (1.63)	[-4.14, 2.29]	-0.11 (0.16) <sup>a</sup>	[-0.44, 0.20] <sup>a</sup>		
Index of moderated mediation	-1.75 (2.11)	[-6.14, 2.25]	-0.18 (0.19) <sup>a</sup>	[-0.58, 0.17] <sup>a</sup>		
2 hours x Appearance Comparison (H)	1.35 (1.54)	[-1.58, 4.50]	0.03 (0.12) <sup>a</sup>	[-0.21, 0.27] <sup>a</sup>		
2 hours x Appearance Comparison (G)	0.14 (1.70)	[-3.37, 3.41]	-0.03 (0.19) <sup>a</sup>	[-0.43, 0.34] <sup>a</sup>		
Index of moderated mediation	-1.22 (2.30)	[-5.89, 3.18]	-0.06 (0.23) <sup>a</sup>	[-0.51, 0.38] <sup>a</sup>		
≥ 3 hours x Appearance Comparison (H)	2.35 (2.48)	[-2.58, 7.39]	0.12 (0.17) <sup>a</sup>	[-0.18, 0.47] <sup>a</sup>		
≥ 3 hours x Appearance Comparison (G)	2.14 (2.04)	[-1.89, 6.31]	0.05 (0.20) <sup>a</sup>	[-0.34, 0.47] <sup>a</sup>		
Index of moderated mediation	-0.21 (3.23)	[-6.58, 6.42]	-0.07 (0.26) <sup>a</sup>	[-0.59, 0.47] <sup>a</sup>		
Predictor: Snapchat time						
< 1 hour x Muscular-ideal internalization (H)	0.61 (0.40)	[0.01, 1.55]			0.10 (0.07) <sup>b</sup>	[-0.04, 0.24] <sup>b</sup>
< 1 hour x Muscular-ideal internalization (G)	0.54 (0.73)	[-0.82, 2.14]			0.02 (0.10) <sup>b</sup>	[-0.18, 0.20] <sup>b</sup>
Index of moderated mediation	-0.07 (0.84)	[-1.72, 1.63]			-0.09 (0.12) <sup>b</sup>	[-0.32, 0.15] <sup>b</sup>
1 hour x Muscular-ideal internalization (H)	1.07 (0.70)	[-0.17, 2.61]			0.24 (0.13) <sup>b</sup>	[-0.02, 0.50] <sup>b</sup>
1 hour x Muscular-ideal internalization (G)	0.41 (0.84)	[-1.23, 2.12]			0.09 (0.10) <sup>b</sup>	[-0.12, 0.29] <sup>b</sup>
Index of moderated mediation	-0.66 (1.10)	[-2.97, 1.40]			-0.15 (0.17) <sup>b</sup>	[-0.48, 0.17] <sup>b</sup>
2 hours x Muscular-ideal internalization (H)	1.57 (1.27)	[-0.55, 4.44]			0.14 (0.24) <sup>b</sup>	[-0.31, 0.71] <sup>b</sup>
2 hours x Muscular-ideal internalization (G)	1.10 (0.72)	[-0.14, 2.69]			0.19 (0.15) <sup>b</sup>	[-0.08, 0.49] <sup>b</sup>
Index of moderated mediation	-0.47 (1.46)	[-3.70, 2.22]			0.05 (0.28) <sup>b</sup>	[-0.54, 0.59] <sup>b</sup>
≥ 3 hours x Muscular-ideal internalization (H)	1.53 (1.86)	[-2.10, 5.61]			0.18 (0.24) <sup>b</sup>	[-0.28, 0.68] <sup>b</sup>
≥ 3 hours x Muscular-ideal internalization (G)	0.71 (0.63)	[-0.36, 2.10]			0.25 (0.10) <sup>b</sup>	[-0.07, 0.47] <sup>b</sup>
Index of moderated mediation	-0.82 (1.95)	[-5.05, 2.88]			0.07 (0.26) <sup>b</sup>	[-0.45, 0.58] <sup>b</sup>
< 1 hour x Appearance Comparison (H)	1.07 (0.83)	[-0.53, 2.79]	0.03 (0.06) <sup>a</sup>	[-0.10, 0.15] <sup>a</sup>		
< 1 hour x Appearance Comparison (G)	1.45 (1.28)	[-0.92, 4.09]	0.11 (0.14) <sup>a</sup>	[-0.16, 0.38] <sup>a</sup>		
Index of moderated mediation	0.39 (1.51)	[-2.49, 3.53]	0.08 (0.15) <sup>a</sup>	[-0.21, 0.39] <sup>a</sup>		

1 hour x Appearance Comparison (H)	0.76 (1.52)	[-2.12, 3.89]	-0.06 (0.11) <sup>a</sup>	[-0.28, 0.17] <sup>a</sup>
1 hour x Appearance Comparison (G)	-0.91 (1.64)	[-4.15, 2.23]	-0.14 (0.17) <sup>a</sup>	[-0.47, 0.19] <sup>a</sup>
Index of moderated mediation	-1.67 (2.26)	[-6.22, 2.55]	-0.08 (0.20) <sup>a</sup>	[-0.49, 0.32] <sup>a</sup>
2 hours x Appearance Comparison (H)	5.34 (3.67)	[-1.54, 13.98]	0.31 (0.29) <sup>a</sup>	[-0.17, 0.96] <sup>a</sup>
2 hours x Appearance Comparison (G)	-1.01 (2.30)	[-5.22, 3.00]	-0.22 (0.28) <sup>a</sup>	[-0.74, 0.27] <sup>a</sup>
Index of moderated mediation	-6.35 (4.32)	[-15.64, 1.42]	-0.53 (0.40) <sup>a</sup>	[-1.40, 0.20] <sup>a</sup>
≥ 3 hours x Appearance Comparison (H)	4.30 (4.30)	[-4.38, 12.52]	0.21 (0.21) <sup>a</sup>	[-0.20, 0.62] <sup>a</sup>
≥ 3 hours x Appearance Comparison (G)	-3.94 (1.72)	[-7.43, -0.88]	<b>-0.51 (0.20)<sup>a</sup></b>	<b>[-0.93, -0.17]<sup>a</sup></b>
Index of moderated mediation	-8.25 (4.60)	[-17.02, 1.15]	<b>-0.73 (0.29)<sup>a</sup></b>	<b>[-1.32, -0.18]<sup>a</sup></b>
Predictor: Dating app time				
< 1 hour x Muscular-ideal internalization (H)	-0.14 (0.41)	[-1.10, 0.55]		-0.02 (0.09) <sup>b</sup> [-0.18, 0.15] <sup>b</sup>
< 1 hour x Muscular-ideal internalization (G)	0.37 (0.68)	[-0.96, 1.76]		0.02 (0.09) <sup>b</sup> [-0.14, .019] <sup>b</sup>
Index of moderated mediation	0.52 (0.80)	[-0.98, 2.15]		0.04 (0.12) <sup>b</sup> [-0.20, 0.28] <sup>b</sup>
≥ 1 hour x Muscular-ideal internalization (H)	-0.15 (1.12)	[-2.73, 1.87]		0.02 (0.25) <sup>b</sup> [-0.51, 0.48] <sup>b</sup>
≥ 1 hour x Muscular-ideal internalization (G)	1.87 (0.95)	[0.08, 3.85]		0.12 (0.10) <sup>b</sup> [-0.09, 0.33] <sup>b</sup>
Index of moderated mediation	2.01 (1.48)	[-0.75, 5.11]		0.10 (0.27) <sup>b</sup> [-0.41, 0.65] <sup>b</sup>
< 1 hour x Appearance Comparison (H)	-0.46 (1.03)	[-2.34, 1.72]	-0.03 (0.08) <sup>a</sup>	[-0.19, 0.15] <sup>a</sup>
< 1 hour x Appearance Comparison (G)	0.75 (1.25)	[-1.62, 3.29]	0.05 (0.13) <sup>a</sup>	[-0.20, 0.32] <sup>a</sup>
Index of moderated mediation	1.20 (1.62)	[-2.02, 4.36]	0.07 (0.16) <sup>a</sup>	[-0.23, 0.39] <sup>a</sup>
≥ 1 hour x Appearance Comparison (H)	-1.10 (1.57)	[-4.39, 1.81]	-0.09 (0.13) <sup>a</sup>	[-0.34, 0.17] <sup>a</sup>
≥ 1 hour x Appearance Comparison (G)	<b>3.44 (1.69)</b>	<b>[0.34, 6.86]</b>	0.20 (0.15) <sup>a</sup>	[-0.07, 0.54] <sup>a</sup>
Index of moderated mediation	<b>4.54 (2.32)</b>	<b>[0.18, 9.40]</b>	0.29 (0.20) <sup>a</sup>	[-0.09, 0.70] <sup>a</sup>

*Note.* Time variables represent daily usage time. Multicategorical predictors were treated using indicator coding (Hayes & Preacher, 2014); non-users (i.e., no usage time) served as the reference group in analyses for Instagram, Snapchat, and dating apps; individuals reporting less than one hour of daily use (including non-users) served as the reference group in analyses for Facebook. Analysis sample sizes ranged from n = 313 (Eating disorder symptoms) to 315 (Body dissatisfaction). Significant conditional indirect effects and Indexes of moderated mediation are in bold. H = Heterosexual men; G = Gay men; CI = bootstrap 95% confidence interval (5000 samples).

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<sup>a</sup>Muscular-ideal internalization considered as a covariate in analyses.

<sup>b</sup>Appearance comparisons considered as a covariate in analyses.

## **Chapter 4: General Discussion**

In this chapter, the results from the studies conducted within the context of the present thesis will be reviewed in light of the objectives and hypotheses initially proposed. Moreover, the contribution of the thesis to the understanding of men's PUBIFRAB and of their underlying factors, as well as the clinical implications of its findings, will be discussed. Finally, this chapter will address the thesis' limitations, as well as directions for future research.

### **Review of the Studies and of their Results**

#### **First study**

The aim of the first study was twofold. First, it sought to describe and compare heterosexual and gay young men's use of three image-centric SNS, namely Facebook, Instagram, and Snapchat (Griffiths, Murray, et al., 2018), as well as their use of dating apps. As hypothesized, the proportion of users of each platform was larger in the group of gay men than the group of heterosexual men; these differences reached statistical significance in the case of Instagram and dating apps. Relatedly, the proportion of men reporting an elevated daily usage time on Facebook, Instagram, and dating apps, but not Snapchat, was significantly greater among gay men relative to heterosexual men. What is more, while most heterosexual dating app users reported having a single active dating profile, most gay men had three or more active profiles; this difference in proportions was statistically significant. Men's motives for dating app use, however, were statistically similar across sexual orientations. Overall, the results relating to the study's first objective are concordant with those from past studies (Seidenberg et al., 2017; Sumter & Vandenbosch, 2019).



The study's second aim was to assess young men's PUBIFRAB (i.e., body fat and muscularity dissatisfaction, eating disorder symptoms, muscle-building behaviour), with particular attention being given to potential sexual orientation- and user status-based variations. Gay men reported significantly greater mean levels of body fat and muscularity dissatisfaction and most eating disorder symptoms (i.e., eating, shape, and weight concern), relative to heterosexual men; a similar trend-level variation was observed for food restraint. These results are consistent with the proposed hypothesis and with those from recent systematic reviews (Calzo et al., 2017; Miller & Luk, 2019; Parker & Harriger, 2020) and meta-analyses (Dahlenburg et al., 2020; He et al., 2020). Muscle-building behaviour, on the other hand, was significantly more prevalent among heterosexual men. Altogether, these results may be indicative of a greater importance accorded to muscularity and leanness by heterosexual and gay men, respectively (Dahlenburg et al., 2020).

In keeping with the study's second objective, interactions between young men's sexual orientation and user status were explored in relation to their PUBIFRAB. No significant sexual orientation by SNS user status interactions emerged and SNS user status main effects were, for the most part, non-significant. These findings run counter to the proposed hypothesis and are surprising, given reports that gay men use SNS more frequently than their heterosexual counterparts (Seidenberg et al., 2017) and that PUBIFRAB are more prevalent among users than non-users of these platforms (Stronge et al., 2015). They may, however, be explained by particularities within the sample. For example, participants' motivations for SNS use, as well as the type of content they access when using these platforms, may not be conducive to PUBIFRAB (Flannery et al., 2020; Saiphoo & Vahedi, 2019). As expected, eating, shape, and weight concern were highest among gay dating app users relative to gay non-users and heterosexual men. Through

their frequent engagement in this competitive online environment, where exposure to idealized male physiques is common (Filice et al., 2019; Rodgers et al., 2020), gay men may come to develop behaviours and concerns consistent with the desire to achieve a lean body (Dahlenburg et al., 2020; Smith et al., 2011). The search for members of the opposite sex may lessen the salience of cultural body norms within the context of heterosexual men's dating app use (Toma et al., 2008), thereby limiting its association to PUBIFRAB for this group. Overall, the results of this first study suggest that dating app use may represent a risk factor for gay men, particularly with respect to behaviours and cognitions centering around a desire to reduce body fat.

## **Second study**

The thesis' second study comprised two objectives. The first was to determine whether daily time spent on Facebook, Instagram, Snapchat, and dating apps was associated with young men's PUBIFRAB (i.e., body dissatisfaction, eating disorder symptoms, muscle-building behaviour) both directly and indirectly, through muscular-ideal internalization and appearance comparisons. Apart from time spent on dating apps, which was significantly associated with elevations in gay, but not heterosexual men's body dissatisfaction and disordered eating, results provided little evidence for direct associations between the variables of interest. However, as hypothesized, there were significant positive indirect effects of frequency of digital media use on men's PUBIFRAB, through the proposed mediators. Specifically, time spent on each platform was, for the most part, indirectly associated with men's body dissatisfaction through muscular-ideal internalization and appearance comparisons. Muscular-ideal internalization and appearance comparisons were also significant mediators of the relationship between time spent on Instagram, Snapchat, and dating apps and men's muscle-building behaviour and disordered eating,

respectively. These results are consistent with those from previous studies (Fatt et al., 2019; Modica, 2020), while specifying that the indirect effects of internalization and comparison processes occur almost exclusively among the most frequent users of digital media (i.e.,  $\geq$  two hours of daily usage time).

The study's second objective was to explore whether the indirect effects of muscular-ideal internalization and appearance comparisons on the above-mentioned digital media use-PUBIFRAB associations varied according to men's sexual orientation. The results evidenced significant sexual orientation-based differences in the indirect effect of appearance comparisons on the relationship between daily time spent on Snapchat and eating disorder symptoms, and the relationship between daily time spent on dating apps and body dissatisfaction. Specifically, neither of these effects were significant for heterosexual men. However, for gay men, frequent daily Snapchat use (i.e.,  $\geq$  three hours) was associated with a significant decrease in mean levels of disordered eating, through appearance comparisons, whereas frequent daily dating app use (i.e.,  $\geq$  one hour) was associated with a significant increase in body dissatisfaction, through appearance comparisons. No other significant moderated mediation effects were observed. Overall, these results contradict the proposed hypothesis and provide little corroboration for a heightened susceptibility, among gay men, to the influence of appearance-focused media through internalization and comparison processes (Carper et al., 2010; Gigi et al., 2016; McArdle & Hill, 2009). Nevertheless, when considered in their entirety, findings from this second study support the application of the tripartite influence model (Thompson et al., 1999) to the context of men's digital media use, while suggesting that dating app use may be a salient correlate of gay men's PUBIFRAB, namely through appearance comparisons.

## **Integration of the Studies' Results**

When synthesized, the results of the present thesis suggest that young adult men's use of digital media are linked to their body image- and food-related attitudes and behaviours, albeit in a way that is perhaps less straightforward than initially predicted. Indeed, the type of platform used (i.e., Facebook, Instagram, Snapchat, dating apps), the type of PUBIFRAB considered (i.e., body dissatisfaction, eating disorder symptoms, muscle-building behaviour), and men's individual characteristics (i.e., sexual orientation, internalization of the muscular body ideal, engagement in appearance comparisons) each appeared to play a role in the observed associations. Thus, the present thesis supports the pertinence of considering the whole of these factors when investigating young men's PUBIFRAB within the context of their digital media use, as this may favour a more nuanced understanding of the risks of their engagement with certain online environments, namely SNS and dating apps. In the same way, the present thesis highlights what appears to be an inherent complexity in attempts at elucidating the association between men's digital media use and PUBIFRAB.

First, when considered in their entirety, the results of the present thesis demonstrate that associations between SNS (i.e., Facebook, Instagram, Snapchat) and men's PUBIFRAB are, for the most part, limited, at least when they are considered as stand-alone, direct sources of potential influence. Indeed, levels of PUBIFRAB were roughly equivalent among users and non-users of Facebook and Instagram. Yet, of the platforms under study, these were most used by participants. Similarly, correlational analyses revealed that daily usage time of Facebook and Instagram were generally unrelated to men's PUBIFRAB. However, when muscular-ideal internalization and appearance comparisons were considered as mediators of SNS use-PUBIFRAB relationships,

significant positive indirect effects were observed for the range of SNS under study, including Facebook and Instagram. Specifically, time spent on SNS was associated with increases in muscular-ideal internalization and appearance comparisons, which were in turn associated with increases in men's PUBIFRAB. In addition to being consistent with findings from prior research (Fatt et al., 2019; Hanna et al., 2017; Modica, 2020) and providing added support for the application of the tripartite influence model (Thompson et al., 1999) to men's engagement with SNS, these results highlight potential platform-based particularities. Namely, certain SNS (i.e., Facebook, Instagram) may not be potent sources of influence for PUBIFRAB. In other words, while their content may trigger internalization and comparison processes, it may not be appearance-focused enough to single-handedly and directly influence PUBIFRAB. Even when mediation mechanisms were considered, these platforms' effect was evident only among their most frequent users (i.e.,  $\geq$  two hours daily). Thus, the findings of the present thesis align with the proposal that the influence of SNS on PUBIFRAB, be it directly or indirectly, result from a cumulative process (i.e., exposure to idealized imagery over prolonged periods of time; Arroyo & Brunner, 2016), while specifying that this may especially apply to SNS where cultural appearance-related norms may be less salient (i.e., Facebook, Instagram).

The latter point appears to obtain additional support when the thesis' results relating to men's Snapchat use are considered. Indeed, Snapchat distinguished itself from the other SNS under study in several ways. Its users experienced greater mean levels of PUBIFRAB (i.e., muscularity dissatisfaction, shape concern) than non-users, and daily use of this platform was directly and positively associated with men's muscle-building behaviour. Moreover, although daily time spent on Snapchat, like time spent on Facebook and Instagram, was indirectly associated with

PUBIFRAB through internalization and comparison processes, these effects were observed among *least frequent* users (i.e.,  $\leq$  one hour per day). Distinctive features of Snapchat, relative to the other SNS under study, may increase the salience of appearance norms and, in this way, provide a potential explanation for the obtained results (Burnell et al., 2021). Snapchat use centers around the exchange of highly edited and sometimes sexually explicit (i.e., nude) “selfies” (Burnell et al., 2021; Salomon & Brown, 2021; Vaterlaus et al., 2016). In addition to being common on Snapchat, these activities have each been positively associated with men’s PUBIFRAB (Burnell et al., 2021; Liong & Cheng, 2019; Yockey et al., 2019). It is worth noting that the association between Snapchat use and muscle-building behaviour was detected solely among heterosexual men, who commonly use this platform to flirt and “hookup” (Moran et al., 2018; Utz et al., 2015). Considering reports that the exchange of sexually explicit content is characteristic of online hookup culture (Moran et al., 2018), heterosexual Snapchat users may frequently engage in this type of behaviour and, in this way, come to experience appearance pressure that may translate into PUBIFRAB. While the particularities of the SNS under study and the way in which they are used cannot be firmly established based on the data presented in the present thesis, its results tend to suggest these factors may play a role in the association between SNS use and men’s PUBIFRAB.

Altogether, the results of the studies conducted within the context of the present thesis also suggest that dating apps may represent an important correlate of PUBIFRAB, particularly among gay men. Indeed, eating disorder symptoms (i.e., eating, weight, and shape concern) were most prevalent among gay users of dating apps. Similarly, daily time spent on these apps was directly and positively associated with gay, but not heterosexual men’s PUBIFRAB. Here too, particularities in men’s use of, and experiences on, these platforms may be at play. Scholars have

noted that dating apps constitute highly competitive environments where users may rely on physical appearance to differentiate themselves from others to secure a partner (Filice et al., 2019; Whitty, 2008). As demonstrated by the present thesis, romantic or sexual motives commonly underly dating app use, particularly among gay men. They may therefore experience appearance pressure when using these apps (Filice et al., 2019), which may translate into PUBIFRAB. This may be exacerbated by the fact that, unlike their heterosexual counterparts, gay men are consistently exposed to idealized and often sexualized images of same-sex individuals when using dating apps, which may promote unhealthy appearance comparisons (Filice et al., 2019). The results of the present thesis support this notion, as they provide preliminary evidence suggesting that appearance comparisons may constitute a particularly strong and significant mechanism through which gay men's dating app use relates to their PUBIFRAB. When considered in their entirety, the present findings highlight the need for continued investigation of the dating app use-PUBIFRAB association and its underlying factors, particularly among gay men.

In a more general manner, the conclusions of the present thesis highlight distinctions, as well as important similarities, in the digital media use-PUBIFRAB relationship between heterosexual and gay men. Beyond demonstrating that Snapchat and dating apps may be important to consider among heterosexual and gay men, respectively, the studies' results indicate that the type of PUBIFRAB with which digital media use is related varies between these groups. Indeed, heterosexual men's use of digital media, namely Snapchat, was consistently associated with muscle-building behaviour, whereas gay men's use of digital media, namely dating apps, was most consistently associated with disordered eating. These results appear to reflect the fact that muscularity constitutes the characteristic of the male body ideal most valued by heterosexual men,

while leanness represents the preeminent characteristic among gay men (Dahlenburg et al., 2020). The finding that muscle-building behaviour and eating disorder symptoms were significantly more prevalent among heterosexual and gay participants, respectively, support this notion. As it relates to digital media use, navigating online environments where appearance norms are particularly salient (e.g., Snapchat, dating apps) may encourage heterosexual and gay men to engage in behaviours meant to emphasize the aspects of the male body ideal that are most important to them; for the former group, this could manifest itself in attempts to build muscle, whereas the latter group may gravitate towards fat-reducing behaviours meant to enhance muscle visibility (Dahlenburg et al., 2020; Smith et al., 2011). Moreover, the data presented here, like those from previous studies (Calzo et al., 2017; He et al., 2020; Miller & Luk, 2019; Parker & Harriger, 2020), show that PUBIFRAB are, for the most part, more prevalent among gay men in comparison to their heterosexual counterparts. However, apart from the findings relating to dating apps, the present thesis provides little evidence to suggest that digital media use accounts for these differences. Indeed, PUBIFRAB were, for the most part, no more prevalent among gay digital media users than gay non-users and heterosexual men. Similarly, the nature of the effects of muscular-ideal internalization and appearance comparisons on the digital media use-PUBIFRAB relationships were roughly equivalent among both groups of men. While these results run counter to those suggesting that gay men may be particularly susceptible to appearance-related media content (Gigi et al., 2016), they may have important implications with regards to the generalizability of intervention strategies. This topic is discussed in greater detail in the following section.



## **Practical Implications**

A series of important practical implications emerge from the results of the present thesis. Indeed, when considered in their totality, the findings outlined in the preceding sections have the potential to inform strategies, be they preventive or interventionist in nature, aimed at attenuating the burden of PUBIFRAB in young adult men. These initiatives can be implemented both at a micro (i.e., individual) and macro (i.e., societal) level. As it relates to individual approaches, the conclusions drawn from the present thesis support the importance of evaluating digital media use among men generally, and among men presenting with body image concerns, specifically. Healthcare professionals should investigate the types and number of platforms used, as well as frequency of and motivations for use. Men should be made aware of the potential negative influence of digital media use and be encouraged to be mindful of them when engaging with online platforms (Breslow et al., 2020; Modica, 2020). When applicable, healthcare providers should act upon men's digital media use. To this point, certain authors have recommended that men be encouraged to limit or cease their use of SNS and dating apps as a means of curbing their impact on PUBIFRAB (Holland & Tiggemann, 2016; Paulson, 2020; Yee et al., 2020). The findings reported here provide a certain level of support for this recommendation. However, while this approach may seem efficacious in theory, its feasibility has been called into question (Filice et al., 2020; Holland & Tiggemann, 2016). The ubiquity of digital media use, particularly SNS, has been evidenced by data presented here and elsewhere (Smith & Anderson, 2018). Indeed, these platforms have become an integral part of individuals' daily lives, namely as a means of communicating with others; this may pose a challenge to efforts aimed at limiting their use (Holland & Tiggemann, 2016). Moreover, attempts at curbing digital media use may be viewed as out of touch by certain subsets of the male population, namely gay men (Filice et al., 2020).

Historically, the internet has provided members of this community with opportunities to connect with one another in a safe and discrete fashion when hostile social or political climates precluded the formation of such connexions in public spaces (Filice et al., 2020). Consequently, gay men may perceive healthcare providers who advocate for a reduction in, or cessation of, their use of digital media platforms as being insensitive to their experiences (Filice et al., 2020).

Alternatively, scholars have recommended that healthcare workers mitigate the impact of digital media use through strategies aiming to make men savvier SNS and dating app users (Flannery et al., 2020; Holland & Tiggemann, 2016; Paulson, 2020; Yee et al., 2020). Consistent with evidence indicating that individuals with a more positive body image tend to be critical of and reject unrealistic appearance-related media images (Chatzopoulou et al., 2020), researchers and clinicians have focused their attention on developing and implementing strategies meant to foster individuals' media literacy (McLean et al., 2016). These strategies aim to empower individuals to think critically about media content so that they can identify, challenge, and propose alternatives to the stereotypical and unhealthy appearance-related messages presented by the media (Wade et al., 2017). In accordance with the tripartite influence model (Thompson et al., 1999), media literacy interventions aim to disrupt the pathway from media exposure to appearance-ideal internalization and appearance comparisons (McLean et al., 2016). This indirect approach to mitigating the media's influence on body image concerns is in alignment with the present thesis, which provided little evidence for a direct link between men's use of digital media and PUBIFRAB, but showed that Facebook, Instagram, Snapchat, and dating apps each indirectly relate to men's PUBIFRAB through internalization and comparison processes. According to these results, the persuasive influence of digital media's idealized portrayals of the male body may be

attenuated through literacy-based interventions that teach men to question the realism and desirability of these portrayals, the similarity of these portrayals to their own personal experiences, as well as the positive outcomes associated with emulating these portrayals (Gordon et al., 2020; McLean et al., 2016). In this way, men may come to consider these strict appearance ideals as unrealistic standards to be internalized and inappropriate targets for comparison, which could have a protective effect against PUBIFRAB (Gordon et al., 2020; McLean et al., 2016).

Media literacy strategies are considered to be among the most effective means of attenuating PUBIFRAB (Wade et al., 2017; Watson et al., 2016). Indeed, they have been found to increase individuals' ability to process media content (McLean et al., 2016; Richardson et al., 2009) and reduce outcomes such as body dissatisfaction and drive for muscularity through the attenuation of processes such as appearance-ideal internalization (McLean et al., 2016; Wade et al., 2017; Yager & O'Dea, 2010). However, extant research has focused on predominantly female or adolescent samples and media literacy interventions have rarely been studied within the context of digital media use, specifically. The present thesis supports calls for the expansion of media literacy programs to incorporate content relating to SNS and dating apps use (Gordon et al., 2020; Holland & Tiggemann, 2016), as well as male-targeted content (Wilksch et al., 2006). Media literacy interventions appear to be complementary to widely disseminated cognitive dissonance-based interventions (Stice et al., 2013) that aim to prevent or attenuate PUBIFRAB by bringing individuals to voluntarily assume a counter-attitudinal stance against unrealistic body ideals and develop skills to resist them (e.g., through the identification of disadvantages of pursuing these ideals; Wade et al., 2017). In fact, research has shown that intervention programs that combine media literacy and dissonance-based strategies are more effective in reducing body image concerns

among young adult men than interventions that do not utilize a combined approach (Yager & O'Dea, 2010). Recently developed effective male-specific dissonance-based interventions (Brown et al., 2017; Brown & Keel, 2015; Jankowski et al., 2017) may therefore represent interesting pre-existing frameworks to which social media literacy techniques can be successfully integrated. In fact, some authors have argued that existing PUBIFRAB prevention efforts that do not address digital media as a key source of pressure may be incomplete (Gordon et al., 2020). The results of the present thesis align with this contention.

As previously stated, digital media distinguishes itself from its traditional counterparts (e.g., television) in important ways (Fardouly & Vartanian, 2016; Perloff, 2014). It may be important to consider these distinctions when developing strategies to counter the influence of digital media use on men's PUBIFRAB. Traditional media operates unidirectionally, in that its content is created and transmitted with little to no input from consumers (Rodgers et al., 2021). In other words, traditional media positions consumers in a passive, if not submissive, role (Perloff, 2014). Consequently, traditional body image-focused media literacy programs mainly emphasize a critical analysis of idealized content (e.g., its realism and credibility; McLean et al., 2016). Conversely, individuals' engagement with digital media (i.e., SNS, dating apps) is far more active, as they can select the content they consume, create content of their own, and interact with the content of others (e.g., through "likes", comments; Perloff, 2014). These particularities may represent fruitful intervention targets for social media literacy programs. First, while lean muscularity is widely disseminated on digital media platforms (Gültzow et al., 2020), there exists a parallel, albeit nascent, category of content featuring diverse body types. This "body positive" imagery aims to challenge narrow sociocultural ideals through the promotion of inclusivity

(Stevens & Griffiths, 2020). Unsurprisingly, a growing body of literature suggests that exposure to this content promotes a more positive body image (Rodgers et al., 2021). Thus, in addition to informing men of the potentially deleterious effect of engaging with idealized appearance-related digital media content, it may be pertinent to inform them of the existence of “body positive” content and of its beneficial effects, and encourage them to follow body positive accounts (Rodgers et al., 2021; Stevens & Griffiths, 2020). Given that digital media platforms contain algorithms that tailor content to users’ interests, men’s engagement with even a limited amount of body positive content will more than likely lead to consistent exposure to body diversity (Stevens & Griffiths, 2020). Exposure to this type of content may facilitate the internalization of more realistic body norms and engagement in less harmful appearance comparisons (Stevens & Griffiths, 2020). The present thesis provides preliminary, indirect support for the efficacy of such strategies. Relatedly, men should be made aware of the power of their online activity (i.e., the photos they post, their “likes” and comments) and of its potential impact on others (Rodgers et al., 2021). They should be encouraged to create body positive content of their own, for example, by posting less edited and appearance-focused content and by reinforcing the creation of similar content through “likes” and comments (Rodgers et al., 2021). Overall, these strategies can help men shift from being passive consumers of online content to active agents of change through the creation of more inclusive online environments that pose a lesser risk for PUBIFRAB (Rodgers et al., 2021).

As previously mentioned, there is evidence supporting the efficacy of strategies that aim to reduce the burden of PUBIFRAB by targeting internalization and comparison processes (Jankowski et al., 2017; McLean et al., 2016). The findings reported in the present thesis may have implications relating the generalizability of such strategies. Indeed, muscular-ideal internalization

and appearance comparisons were significant mediators of the effect of each digital media platform under study (i.e., Facebook, Instagram, Snapchat, dating apps) on a variety of male-centric PUBIFRAB (i.e., body dissatisfaction, disordered eating, muscle-building behaviour). This implies that, while it is imperative to integrate digital media-related content to PUBIFRAB-reducing interventions (Gordon et al., 2020), this content may not need to be platform-specific. Rather, a more general approach that encourages men to develop a critical and analytical posture towards appearance-focused content (Wade et al., 2017) may be effective at reducing the prevalence of a variety of PUBIFRAB, regardless of the platform being used, insofar as it facilitates the attenuation of comparisons to this content and the internalization of the ideals it promotes. Similarly, the results of the present thesis suggest that approaches targeting internalization and comparison processes may be applicable across subgroups of the male population, as the strength of internalization and comparison effects generally did not vary as a function of participants' sexual orientation. Nevertheless, gay men reported significantly greater levels of PUBIFRAB than heterosexual men. The identification of factors that underly this difference remains pertinent, as this could possibly inform targeted prevention and intervention strategies. The present thesis suggests that gay men's use of dating apps may represent one such factor. Clinicians should be cognizant of the popularity of dating apps among gay men, of the particularities of their experience on these apps relative to their heterosexual counterparts (Toma et al., 2008), and of the body image-related risks that may be associated with their use of these apps. Actions meant to support or accompany gay men in their use of dating apps and interventions aimed at fostering distress tolerance and resilience towards the objectification and appearance-based rejection often encountered on these apps may prove to be useful (Breslow et al., 2020; Filice et al., 2019).

In addition to informing individual approaches to decreasing the influence of men's digital media use on PUBIFRAB, such as those discussed above, the present thesis gives rise to several reflections relating to the need for a broader societal change. The importance of public health measures for the prevention of body image concerns has been increasingly recognized (Paxton, 2013), and several organizations worldwide have acted accordingly (Gauvin & Steiger, 2012). Policies have often focused on reducing the proliferation of strict body ideals by targeting industries such as those related to fashion and advertising (Gauvin & Steiger, 2012). Based on the conclusions of the present thesis, it appears pertinent for policy makers to consider digital media as an important perpetuator of body ideals and to develop policies that are specific to these platforms, or at the very least include a digital media component. Several authors (Wade et al., 2017; Yee et al., 2020) have recommended that strategies be developed and implemented in collaboration with digital media developers. For example, digital media developers could reconsider the centrality of image-focused content on their platforms and offer users alternative forms of self-expression or reduce or eliminate access to in-app photo-editing tools to promote more realistic self-presentations (Wade et al., 2017; Yee et al., 2020). Alternatively, digital media developers can promote users' social media literacy by informing them of the potential effects of consuming idealized content on their platforms, adding disclaimers to edited content, and providing strategies to mitigate or avoid exposure to idealized content, as well as resources to better cope with it (Breslow et al., 2020; Rodgers et al., 2021; Yee et al., 2020). While there is undeniable value in establishing close partnerships with digital media developers, enticing them to shift their practices away from a model that, until now, has been incredibly profitable, may pose a challenge (Rodgers et al., 2021; Wade et al., 2017). Nevertheless, digital media platforms can be used by government agencies, educational institutions, and community organizations alike to

create and disseminate social movements and campaigns meant to sensitize users to, and protect them from, harmful digital media influences in a way that can be effective, wide-reaching, and economical (Arroyo & Brunner, 2016; Rodgers et al., 2021; Yager & O'Dea, 2010).

## **Distinctive Contributions of the Thesis**

When considered in its entirety, the present thesis contributes to the literature on young men's body image and its sociocultural underpinnings in several ways. The first of these contributions relates to the type of sociocultural influence considered. Interpersonal (i.e., family, peer) and traditional media influences have been extensively investigated in relation to men's PUBIFRAB (Girard et al., 2018; Schaefer et al., 2021; Tylka, 2011; Tylka & Andorka, 2012). The latter factor has been a particular focus of researchers' attention (Barlett et al., 2008; Blond, 2008; Hausenblas et al., 2013), likely due to its reputation as the most important promoter of cultural appearance norms (Girard et al., 2018; Tiggemann, 2011). However, the media landscape has evolved at a rapid pace and digital forms of media have come to play an increasingly central role in individuals' daily lives (Derenne & Beresin, 2018). Despite the popularity of certain types of digital media, namely SNS and dating apps (Smith & Anderson, 2018; Statista Research Department, 2021b), and the centrality of appearance-focused content on these platforms (Griffiths, Murray, et al., 2018; Gültzow et al., 2020), they have received relatively little attention from body image researchers. By focusing specifically on SNS and dating apps, the present thesis contributed to a more comprehensive understanding of the types of sociocultural factors with a potential to influence young men's PUBIFRAB. Importantly, the studies that were conducted distinguish themselves from most investigations into the digital media use-PUBIFRAB relationship through the simultaneous and differentiated exploration of various digital media



platforms (i.e., Facebook, Instagram, Snapchat, dating apps). This allowed for the identification of platforms whose use may be especially deleterious to men's PUBIFRAB (i.e., Snapchat, dating apps), while also highlighting important commonalities across platforms, namely as it relates to the processes on which they act.

An additional contribution of the present thesis lies in its focus on the male experience. Extant research on PUBIFRAB, particularly that which relates to the potential influence of digital media use, has focused almost exclusively on female samples. To this point, in a recent meta-analysis of the SNS use-PUBIFRAB relationship (Saiphoo & Vahedi, 2019), only seven of the 63 samples analyzed were composed entirely of men; the remaining samples were at least 50% female. Nevertheless, these authors found that the significant positive association observed between SNS use and PUBIFRAB did not differ between males and females, suggesting that a better understanding of men's engagement with digital media, as well as its potential consequences, is necessary. The studies conducted in the context of the present thesis addressed this need in two important ways: first, by providing a clear descriptive portrait of key aspects (e.g., user status, usage time) of men's use of various digital media platforms and second, by investigating the associations between use and male-centric PUBIFRAB. Indeed, the outcome variables considered were chosen based on existing recommendations (Cafri & Thompson, 2004; Griffiths, Murray, et al., 2018; Ridgeway & Tylka, 2005) to assure that they corresponded with traits that are central to men's body image, namely leanness (i.e., absence of body fat) and muscularity. Moreover, these studies were among the few to explore men's digital media use in relation to concrete behaviours meant to achieve lean muscularity (i.e., disordered eating, muscle-building behaviour; Murray et al., 2017). In this way, the data presented in the present thesis, while

cross-sectional in nature, provide a more complete understanding of men's online experiences and its potential effects.

The present thesis aimed to go beyond the simple exploration of direct associations between men's digital media use and PUBIFRAB by considering the role of men's personal characteristics (i.e., muscular-ideal internalization, appearance comparisons, sexual orientation) within the context of these relationships. This constitutes an important contribution to the extant literature. First, in accordance with the tripartite influence model (Thompson et al., 1999), both muscular ideal-internalization and appearance comparisons were explored as mediators of the associations between men's digital media use and PUBIFRAB. Extant quantitative research on these indirect effects has disproportionately focused on comparison processes and been conducted exclusively in relation to men's SNS use. Thus, the presents thesis is one of few research efforts to extend the tripartite influence model to men's digital media use in a more comprehensive manner, namely through the simultaneous exploration of internalization and comparison processes within the context of men's engagement with a variety of digital media platforms. Notably, the present thesis represents, to the best of the authors' knowledge, the first attempt to test whether the factors proposed by the tripartite influence model mediate the association between men's dating app use and PUBIFRAB using quantitative methods. In this way, it provides a more detailed, albeit cross-sectional portrait of the mechanisms digital media act upon to promote PUBIFRAB.

In a related manner, the present thesis distinguishes itself form previous research efforts by means of its consideration of men's sexual orientation. Extant research has consistently shown that PUBIFRAB are significantly more prevalent among gay men in comparison to their heterosexual

counterparts (Calzo et al., 2017; He et al., 2020; Miller & Luk, 2019; Parker & Harriger, 2020). Consequently, there have been calls for the elucidation of the factors that drive this difference (Dahlenburg et al., 2020). While there is evidence that gay men's digital media use may constitute one such factor (e.g., due to a more frequent use of these platforms among gay men or their heightened susceptibility to appearance-focused media; Flannery et al., 2020; Gigi et al., 2016; Seidenberg et al., 2017), this possibility had yet to be explored. To address this limitation, the objectives and hypotheses of the present thesis centered around the exploration of sexual orientation-based variations in the prevalence of men's digital media use and PUBIFRAB, as well as in the way these variables relate to one another. This resulted in the identification of important commonalities in the factors that underly the association between digital media use and PUBIFRAB among both groups of men, while simultaneously bringing to light important sexual orientation-based differences, namely with respect to dating app use. The present thesis therefore provides a more diverse perspective into the male experience of digital media use and of its impact.

## **Limitations of the Thesis and Directions for Future Research**

Despite their contributions, the studies conducted within the context of the present thesis are not without limitations; these may represent pertinent avenues for future research. The first set of limitations relate to the validity and generalizability of the thesis' findings. The possibility that findings correspond to type 1 error because of test multiplicity cannot be overlooked and results should thus be interpreted with caution. Accordingly, future studies should seek to replicate the present findings. In a related manner, the studies' samples were characterized by a certain homogeneity, as they consisted exclusively of cisgender young adult men who identified as either heterosexual and homosexual and who were, for the most part, white (i.e., 86.4%). The studies'

results are therefore applicable to a very specific segment of the male population and may not be representative of the broader male experience. A replication of these studies using a more diverse sample may thus be warranted. For example, while young adulthood may represent a period of vulnerability to PUBIFRAB (Murray et al., 2020), male youth and men over the age of 30 are not immune to body image concerns and the nature of these concerns may vary across the lifespan (M.P. McCabe & Ricciardelli, 2004). Similarly, digital media use, namely the use of SNS, is common across age groups, albeit to varying degrees (Smith & Anderson, 2018). Thus, it appears pertinent to investigate digital media influences on PUBIFRAB among males of varying ages. Similarly, there is a need for a broader representation of sexual and gender minority populations within this field of study. Comparative research has shown that bisexual men and transgender individuals report greater levels of PUBIFRAB than their heterosexual and cisgender counterparts, respectively (Parker & Harriger, 2020), and that, in some cases, their PUBIFRAB levels exceed those of gay men (Cella et al., 2013). Moreover, digital media may have come to hold a significant place in the daily lives of bisexual men and transgender individuals who, like their gay counterparts, may have gravitated towards this technology to avoid stigmatization and to safely create connexions with like individuals (Filice et al., 2020). In addition to ensuring a greater generalizability of results, replicating the studies conducted within the context of the present thesis using more diverse samples could provide data with the potential to inform more wide-reaching interventions.

The nature of the data collected constitute an additional limitation of the present thesis. First, the constructs under study were entirely assessed using self-report measures. Even though these measures demonstrated adequate psychometric properties and were, for the most part,

validated among men generally, and gay men, specifically, bias inherent to these types of measures cannot be completely eliminated. The use of an online questionnaire may have provided a certain buffer, as this method of data collection is known to foster more honest responses to questions addressing taboo topics, such as PUBIFRAB (Gnambs & Kaspar, 2015). However, this limited recruitment to individuals with internet access. Relatedly, assessments relied entirely on participants recall, which could have introduced inaccuracies in the data, particularly those relating to daily usage time of Facebook, Instagram, Snapchat, and dating apps. Future research may be able to circumvent this by utilizing activity-tracking software that is readily available on smartphones and similar devices. This technology, which breaks down individuals' daily screen time according to the apps and websites they use, may prove to be a useful tool in the collection of accurate data (Apple, 2022). Moreover, the data presented in the present thesis were collected at a single time point. However, sociocultural models of body image, including the tripartite influence model, posit that PUBIFRAB are *caused*, be it directly or indirectly, by exposure to cultural body ideals (Thompson et al., 1999; Tiggemann, 2011). While the present thesis provides compelling cross-sectional evidence for the application of the tripartite influence model to men's engagement with digital media, it provides little insight into how men's digital media use, internalization and comparison processes, and PUBIFRAB relate to one another across time. Future research should aim to clarify questions relating to temporality and directionality using a longitudinal design. Exploring how these associations evolve across the male lifespan may be pertinent as well. A more comprehensive understanding of the digital media use-PUBIFRAB association, and of the factors that may underly or act upon it, might similarly be procured using more sophisticated statistical methods to test more complex and integrative models than those presented in the present thesis (e.g., structural equation modeling).

The data relating specifically to men's SNS and dating app use may represent an additional limitation. The descriptive data revealed an imbalance in the number of users and non-users of certain platforms under study. Namely, few men ( $n \leq 17$ ) reported being non-users of Facebook. Similarly, few participants reported daily digital media usage times that exceeded one hour, particularly for Snapchat and dating apps. This imbalance may have limited the statistical power of the analyses conducted within the context of the present thesis (Cohen, 1992), thereby precluding a proper assessment and comprehensive understanding of the impacts of digital media use, relative to non-use, and of varying frequencies of use. Future research should employ recruitment strategies that ensure a more balanced distribution of participants across digital media use categories, be they with respect to user status or frequency of use. In a related manner, the use of a categorical measure of daily usage time may have contributed to the limited variability observed. The use of a continuous measure may allow for greater variability and, in this way, increase the likelihood of detecting significant digital media use-PUBIFRAB associations. The exploration of the impact of a more diverse range of digital media platforms, particularly dating apps, is also warranted.

In a more general way, although measures of overall SNS and dating app use, such as daily usage time, may be invaluable in establishing a preliminary understanding of the digital media use-PUBIFRAB relationship, they remain limited in their scope (Kim & Chock, 2015). Indeed, individuals' engagement with digital media is multifaceted (Kim & Chock, 2015) and, as the results of the present thesis suggest, measures of daily usage time may not be sufficiently nuanced to determine whether engagement is associated with men's PUBIFRAB, at least not when used as standalone measures. Similarly, they do little in the way of providing a comprehensive

understanding of the digital media use-PUBIFRAB relationship. To this point, while it is possible to infer, based on previous research (Burnell et al., 2021; Filice et al., 2019), why the use of certain platforms (i.e., Snapchat, dating apps) was found to be associated with PUBIFRAB among certain groups of men, the nature of our data made it difficult to draw any firm conclusions. Future research would benefit from the inclusion of additional, more precise measures of men's online experiences. Based on the results of the present thesis, as well as data presented elsewhere (Holland & Tiggemann, 2016; Saiphoo & Vahedi, 2019), elucidating the nature of men's engagement with digital media, for example, by assessing their motives for digital media use, the types of activities they engage in while using these platforms, and the type of content they encounter on these platforms, may be of particular importance in gaining a more complete understanding of the digital media use-PUBIFRAB relationship. The investigation of additional personal factors, such as personality-based variables, may also constitute a fruitful avenue for future research (Castro & Barrada, 2020; Saiphoo & Vahedi, 2019). The tripartite influence model may serve as a solid theoretical base for the integration of the above-mentioned factors (Filice et al., 2020; Perloff, 2014). Insofar as these factors are considered in conjunction with men's sexual orientation and sexual orientation-specific experiences (Filice et al., 2020), this integrative approach may also provide insight into whether and how digital media platform use relates to the higher prevalence of PUBIFRAB among gay men relative heterosexual men.

## **Conclusion**

The present thesis contributed to the elucidation of the association between digital media use and PUBIFRAB, as well as its underlying mechanisms, in a sample of young adult heterosexual and gay men. This was achieved by investigating heterosexual and gay men's use of

various digital media platforms (i.e., Facebook, Instagram, Snapchat, dating apps) in relation to male-specific PUBIFRAB (i.e., body fat and muscularity dissatisfaction, eating disorder symptoms, muscle-building behaviour) both directly and indirectly, through muscular-ideal internalization and appearance comparisons. While findings provide little support for a direct association between digital media use and PUBIFRAB among both groups of men, internalization and comparison processes emerged as significant mediating mechanisms of the relationship between each digital media platform and PUBIFRAB under study. While findings were generally equivalent across sexual orientations, dating apps appear to constitute a particularly potent risk factor for gay men's PUBIFRAB, specifically, both directly and through appearance-comparisons. Overall, the present thesis supports the continued application of the tripartite influence model (Thompson et al., 1999) to men's online experiences. Moreover, its findings have the potential to inform effective and generalizable social media literacy programs aiming to prevent or attenuate the burden of young men's PUBIFRAB (Gordon et al., 2020). Nevertheless, additional research is needed to achieve a more comprehensive understanding of the digital media use-PUBIFRAB association among men. Notably, it would be interesting to explore the association between the above-mentioned variables in a more diverse sample and using a longitudinal design. An elucidation of the motives for men's digital media use, the features and content they engage with while on these platforms, and the ways these factors relate to PUBIFRAB may likewise represent a fruitful avenue for future research.



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# Appendices

# **Appendix 1: Information and Consent Form**

## FORMULAIRE D'INFORMATION ET DE CONSENTEMENT

### **L'influence de facteurs socioculturels sur les attitudes et comportements à l'égard de l'alimentation, du poids et de l'image corporelle : Une étude comparative entre les hommes gais et hétérosexuels**

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#### **CHERCHEUR ÉTUDIANT :**

Olivier Di Pietrantonio, B.A., Candidat au doctorat (Ph.D. recherche et intervention),

Département de psychologie, Université de Montréal

Téléphone : (514) 343-6111, post 3870

Adresse courriel : olivier.di.pietrantonio@umontreal.ca

#### **DIRECTRICE DE RECHERCHE :**

Dominique Meilleur, Ph.D., Professeure agrégée,

Département de psychologie, Université de Montréal

Téléphone : (514) 343-5866

Adresse courriel : dominique.meilleur@umontreal.ca

Vous êtes invité à participer à un projet de recherche. Avant d'accepter, veuillez prendre le temps de lire ce document qui présente les conditions de participation au projet. Si vous avez des questions sur ce projet, n'hésitez à communiquer avec les chercheurs de l'étude (voir leurs coordonnées ci-haut).

## **A) RENSEIGNEMENTS AUX PARTICIPANTS**

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### **1. Objectifs de la recherche**

Ce projet de recherche s'adresse aux garçons et aux hommes âgés de 14 à 30 ans. Il vise deux objectifs. Le premier est de décrire et d'évaluer les attitudes et les comportements à l'égard de l'alimentation, du poids et de l'image corporelle chez les hommes, et de voir si ces attitudes et comportements varient selon l'orientation sexuelle. Le deuxième objectif de ce projet de recherche est d'explorer l'effet de certains facteurs socioculturels (p. ex. les médias, les influences interpersonnelles, etc.) sur les attitudes et comportements à l'égard de l'alimentation, du poids et de l'image corporelle chez les hommes, et de voir si ces effets varient selon l'orientation sexuelle.

### **2. Participation à la recherche**

Votre participation à cette étude consiste à remplir une série de 18 questionnaires portant sur certaines caractéristiques sociodémographiques (p.ex. âge, statut relationnel, etc.), votre orientation, vos attitudes et comportements à l'égard de l'alimentation, du poids et de l'image corporelle, votre exposition à certains facteurs socioculturels (p.ex. les médias, vos pairs, parents, etc.), vos expériences de victimisation, vos attitudes envers l'homosexualité, votre niveau de participation à la communauté gaie (si applicable), votre bien-être psychologique (p.ex. estime de soi, symptômes dépressifs, etc.), certains traits de votre personnalité et votre relation amoureuse (si applicable). Si vous choisissez de participer à ce projet de recherche, vous aurez accès aux questionnaires en version électronique (en ligne). Ces questionnaires prendront approximativement 60 minutes à remplir. La majorité des questions sont à choix de réponse.

### **3. Risques et inconvénients**

Il n'y a pas de risque particulier à participer à ce projet. Cependant, certains sujets sensibles seront abordés dans les questionnaires. Répondre aux questionnaires pourrait donc possiblement occasionner un inconfort ou vous rappeler un (ou des) épisode(s) plus difficile(s) de votre vie, ou un (ou des) événement(s) actuel(s) stressant(s), ce qui pourrait susciter des émotions négatives, telles que de la tristesse ou de la colère. Parmi les sujets sensibles abordés par les questionnaires, il y a :

- Vos attitudes et comportements à l'égard de votre l'alimentation, votre poids et votre image corporelle
- Vos expériences de victimisation
- Vos attitudes envers votre orientation sexuelle et envers l'homosexualité de façon générale
- La présence de symptômes dépressifs

Advenant la présence d'un inconfort ou d'émotions négatives, vous pourrez à tout moment refuser de répondre à une question ou vous retirer de l'étude. De plus, à différents endroits dans le questionnaire vous verrez apparaître les noms et coordonnées de diverses ressources en lien avec les thèmes abordés. Vous pourrez les utiliser au besoin.

### **4. Contact des participants**

Il est possible que certaines de vos réponses aux questionnaires suggèrent ou indiquent que vous viviez des moments difficiles caractérisés par la présence d'idéations suicidaires, de symptômes dépressifs sévères, de symptômes suggérant la présence d'un trouble de la conduite alimentaire et/ou

des expériences de victimisation potentiellement dangereuses. Afin de pouvoir vous contacter advenant une telle situation, nous vous demandons de nous fournir votre adresse courriel de façon à ce qu'un l'un des chercheurs puisse vous joindre pour assurer votre sécurité.

Adresse courriel : \_\_\_\_\_

## **5. Avantages et bénéfiques**

Vous ne retirerez aucun avantage direct en participant à ce projet de recherche. Cependant, votre participation pourra contribuer à l'avancement des connaissances sur les attitudes et comportements à l'égard de l'alimentation, du poids et de l'image corporelle chez les hommes, ainsi que sur les influences socioculturelles pouvant les affecter.

## **6. Confidentialité**

Les renseignements personnels que vous nous donnerez demeureront strictement confidentiels. Aucune information permettant de vous identifier de quelque façon ne sera divulguée ou utilisée pour une éventuelle publication. De plus, chaque participant à la recherche se verra attribuer un code (de recherche) et seuls les chercheurs principaux de l'étude auront accès à cette liste. Les données seront conservées dans un lieu sûr, soit un classeur verrouillé et un disque dur encrypté situés dans le laboratoire de recherche fermé à clé de Dominique Meilleur situé à l'Université de Montréal. Seuls les chercheurs principaux y auront accès. Toute information personnelle (c.-à-d., votre adresse courriel) sera détruite 7 ans après la fin du projet. Seules les données ne permettant pas de vous identifier pourront être conservées après cette période.



## 7. Droit de retrait

Votre participation à ce projet de recherche est entièrement volontaire et vous pouvez à tout moment vous retirer de la recherche sur simple avis verbal ou par écrit sans devoir justifier votre décision et sans conséquence pour vous. Si vous décidez de vous retirer de la recherche, veuillez communiquer avec un des chercheurs. Leurs coordonnées sont indiquées ci-haut. À votre demande, tous les renseignements qui vous concernent pourront aussi être détruits. Cependant, après le déclenchement du processus de publication, il sera impossible de détruire les analyses et les résultats portant sur vos données.

## B) CONSENTEMENT DU PARTICIPANT

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### Déclaration du participant

En cochant la case ici-bas, j'atteste que :

- Je comprends que je peux prendre mon temps pour réfléchir avant de donner mon accord ou non à participer à la recherche
- Je peux poser des questions à l'équipe de recherche et exiger des réponses satisfaisantes
- Je comprends qu'en participant à ce projet de recherche, je ne renonce à aucun de mes droits ni ne dégage les chercheurs de leurs responsabilités
- J'ai pris connaissance du présent formulaire d'information et de consentement et j'accepte de participer au projet de recherche

**J'accepte de participer au projet de recherche**

**Oui**

**Non**

**Pour toute question relative à l'étude, ou pour vous retirer de la recherche,** veuillez communiquer avec Dominique Meilleur (dominique.meilleur@umontreal.ca, 514-343-5866) ou Olivier Di Pietrantonio (olivier.di.pietrantonio@umontreal.ca, 514-343-6111 post 3870).

Pour toute préoccupation sur vos droits ou sur les responsabilités des chercheurs concernant votre participation à ce projet, vous pouvez contacter le Comité d'éthique de la recherche en arts et en sciences de l'Université de Montréal par courriel à l'adresse [ceras@umontreal.ca](mailto:ceras@umontreal.ca) ou par téléphone au 514 343-7338 ou encore consulter le site web <http://recherche.umontreal.ca/participants>.

Toute plainte relative à votre participation à cette recherche peut être adressée à l'ombudsman de l'Université de Montréal en appelant au numéro de téléphone 514 343-2100 ou en communiquant par courriel à l'adresse [ombudsman@umontreal.ca](mailto:ombudsman@umontreal.ca) (l'ombudsman **accepte les appels à frais virés**).

Cette recherche a reçu l'approbation du Comité d'éthique de la recherche en arts et en sciences de l'Université de Montréal (CERAS).

Numéro de projet : CERAS-2017-18-052-P

## Appendix 2: Study Questionnaires

### Sociocultural Attitudes Toward Appearance Questionnaire-4-Revised

#### (SATAQ-4R)

S'il vous plaît, lisez attentivement chacun des items suivants et indiquez la réponse qui correspond le mieux à votre niveau d'accord avec chaque énoncé.

	Complètement en désaccord	Plutôt en désaccord	Ni en accord ni en désaccord	Plutôt en accord	Complètement d'accord
Il est important pour moi de paraître musclé.					
Je pense beaucoup au fait de paraître musclé.					
Je veux que mon corps paraisse musclé.					
Je voudrais avoir un corps qui paraît très musclé.					

## Physical Appearance Comparison Scale-Revised (PACS-R)

Les individus comparent parfois leur apparence physique à celle des autres. Cette comparaison peut être par rapport au poids, à la taille du corps, à la silhouette, à la graisse corporelle ou à l'apparence en générale. En pensant à la manière dont vous vous comparez généralement aux autres, utilisez l'échelle ci-dessous et indiquez à quelle fréquence vous faites ces types de comparaisons.

	Jamais	Rarement	Parfois	Souvent	Toujours
Lorsque je sors en public, je compare mon apparence physique à l'apparence physique des autres.					
Lorsque je rencontre une nouvelle personne (du même sexe), je compare la grosseur de mon corps à la grosseur du leur.					
Lorsque je suis au travail ou à l'école, je compare la forme de mon corps à la forme du corps des autres.					
Lorsque je suis en public, je compare le gras de mon corps au gras du corps des autres.					
Lorsque je magasine des vêtements, je compare mon poids au poids des autres.					
Lorsque je suis dans un party, je compare la forme de mon corps à la forme du corps des autres.					
Lorsque je suis avec un groupe d'amis, je compare mon poids au poids des autres.					
Lorsque je suis en public, je compare la taille de mon corps à la taille du corps des autres.					
Lorsque je suis avec un groupe d'amis, je compare la grosseur de mon corps à la grosseur du corps des autres.					
Lorsque je mange dans un restaurant, je compare le gras de mon corps au gras du corps des autres.					

Lorsque je suis à la salle de sport (« gym »), je compare mon apparence physique à l'apparence physique des autres.

## Revised Male Body Attitudes Scale (MBAS-R)

S'il vous plait, indiquez si chaque énoncé s'applique à vous jamais, rarement, parfois, souvent ou toujours.

	Jamais	Rarement	Parfois	Souvent	Toujours
Je pense que mon corps est trop peu musclé.					
Je pense que mes jambes ne sont <i>pas assez</i> musclées.					
Je pense que mes bras devraient être plus musclés.					
Je me sens gêné par rapport à ma musculature.					
Je pense que mon dos devrait être plus musclé.					
Je pense que mon torse devrait être plus musclé.					
Je suis satisfait de ma musculature.					
Je pense que mon corps devrait être plus mince (c.-à-d. être moins gras).					
Je pense que j'ai trop de gras sur mon corps.					
Je me sens gros lorsque je mange des sucreries, des gâteaux ou d'autres aliments riches en calories.					
Je me sens excessivement gros.					
Je me sens mal vis-à-vis de ma graisse corporelle lorsque je vois mon reflet (p.ex., dans un miroir ou une fenêtre).					
Je souhaiterais être plus grand.					
Je suis satisfait de ma taille (grandeur).					
J'ai honte de ma taille (grandeur).					

## Eating Disorder Examination Questionnaire (EDE-Q)

Les questions suivantes se réfèrent aux quatre dernières semaines (28 jours). Veuillez lire chaque question attentivement. Veuillez répondre à chaque question. Merci.

Questions 1 à 12: S'il vous plaît, sélectionnez le chiffre approprié dans les colonnes de droite. Et n'oubliez pas que les questions ne réfèrent qu'aux (4) dernières semaines (28 jours) seulement.

Dans les 28 derniers jours, combien de jours...

	Aucune journée	1 à 5 jours	6 à 12 jours	13 à 15 jours	16 à 22 jours	23 à 27 jours	Tous les jours
Avez-vous volontairement <u>essayé</u> de limiter la quantité de nourriture que vous mangez pour influencer votre silhouette ou votre poids (que vous ayez réussi ou non)?							
Avez-vous passé de longues périodes de temps (8 heures éveillées ou plus) sans manger quoi que ce soit afin d'influencer votre silhouette ou votre poids?							
Avez-vous <u>essayé</u> d'exclure de votre alimentation n'importe quel aliment que vous aimez afin d'influencer votre silhouette ou votre poids (que vous ayez réussi ou non)?							
Avez-vous <u>essayé</u> de suivre des règles précises à propos de votre alimentation (p. ex. manger un nombre de calories limitées) afin d'influencer votre silhouette ou votre poids (que vous ayez réussi ou non)?							
Avez-vous eu le désir catégorique d'avoir l'estomac <u>vide</u> dans le but d'influencer votre silhouette ou votre poids?							
Avez-vous eu le désir catégorique d'avoir un ventre <u>totallement plat</u> ?							
Est-ce que le fait de penser à la <u>nourriture</u> , les calories ou à							

<u>manger</u> ont fait qu'il était très difficile de vous concentrer sur des choses qui vous intéressent (p. ex. travailler, suivre une conversation ou lire)?							
Est-ce que le fait de penser à votre <u>silhouette ou votre poids</u> ont fait qu'il était très difficile de vous concentrer sur des choses qui vous intéressent (p. ex. travailler, suivre une conversation ou lire)?							
Avez-vous eu une peur catégorique de perdre le contrôle de votre alimentation?							
Avez-vous eu une peur catégorique que vous pourriez prendre du poids?							
Vous êtes-vous senti gros?							
Avez-vous eu un fort désir de perdre du poids?							

Questions 13 à 18: S'il vous plaît, écrivez le chiffre approprié dans les colonnes de droite. Et n'oubliez pas que les questions ne réfèrent qu'aux (4) dernières semaines (28 jours) seulement.

Dans les quatre dernières semaines (28 jours)...

Dans les 28 derniers jours, combien de fois avez-vous mangé ce que d'autres personnes considéreraient une quantité de nourriture inhabituellement grande (compte tenu des circonstances)? \_\_\_\_\_

À combien de ces occasions avez-vous eu l'impression d'avoir perdu le contrôle de votre prise alimentaire (au moment où vous mangiez)? \_\_\_\_\_

Dans les 28 derniers jours, pendant combien de JOURS ont eu lieu de tels épisodes d'accès hyperphagique ou d'excès de nourriture (c.-à-d., où vous avez mangé une quantité de nourriture inhabituellement grande et vous avez eu une impression de perte de contrôle à ce moment)? \_\_\_\_\_

Dans les 28 derniers jours, combien de fois vous êtes-vous rendu malade (vomir) afin de contrôler votre silhouette ou votre poids? \_\_\_\_\_

Dans les 28 derniers jours, combien de fois avez-vous pris des laxatifs afin de contrôler votre silhouette ou votre poids? \_\_\_\_\_

Dans les 28 derniers jours, combien de fois avez-vous fait de l'exercice d'une façon « déterminée » ou « compulsive » afin de contrôler votre silhouette ou votre poids? \_\_\_\_\_



Questions 19 à 21: S'il vous plait, sélectionnez le chiffre approprié. Prenez bien note que pour ces questions, le terme « accès hyperphagique » signifie manger une quantité de nourriture que d'autres personnes considèreraient comme inhabituellement grande compte tenu des circonstances, accompagné par un sentiment d'avoir perdu le contrôle de ce que vous mangez.

Dans les 28 derniers jours...

	Aucune journée	1 à 5 jours	6 à 12 jours	13 à 15 jours	16 à 22 jours	23 à 27 jours	Tous les jours
Dans les 28 derniers jours, combien de jours avez-vous mangé en secret (c.-à-d., furtivement, en cachette)? ...Ne comptez pas les épisodes « d'accès hyperphagiques ».							
	Aucune fois	Quelques fois	Moins de la moitié	La moitié des fois	Plus de la moitié	La plupart des fois	Toutes les fois
Dans les 28 derniers jours, combien de fois vous êtes-vous senti coupable (ressenti avoir mal agi) en mangeant à cause des conséquences que cela pourrait avoir sur votre silhouette ou votre poids? ...Ne comptez pas les épisodes « d'accès hyperphagiques ».							

	Pas du tout	...	Un peu	...	Modérément	...	Nettement
Dans les 28 derniers jours, jusqu'à quel point avez-vous été préoccupé que d'autres personnes vous voient manger? ...Ne comptez pas les épisodes « d'accès hyperphagiques ».							

Questions 22 à 28: S'il vous plaît, sélectionnez le chiffre approprié dans les colonnes de droite.

Et n'oubliez pas que les questions ne réfèrent qu'aux (4) dernières semaines (28 jours)

seulement.

Dans les 28 derniers jours ...

	Pas du tout	...	Un peu	...	Modérément	...	Nettement
Votre <u>poids</u> a-t-il influencé la façon dont vous pensez à vous (vous jugez) en tant que personne?							
Votre <u>silhouette</u> a-t-elle influencé la façon dont vous pensez à vous (vous jugez) en tant que personne?							
Jusqu'à quel point auriez-vous été contrarié si on vous avait demandé de vous peser une fois par semaine (ni plus, ni moins souvent) pour les quatre prochaines semaines?							
Jusqu'à quel point avez-vous été insatisfait de votre <u>poids</u> ?							
Jusqu'à quel point avez-vous été insatisfait de votre <u>silhouette</u> ?							
Jusqu'à quel point vous êtes-vous senti inconfortable de voir votre corps (p.ex. voir votre silhouette dans le miroir, votre réflexion dans la vitre d'un magasin, pendant que vous vous déshabillez ou prenez un bain ou une douche)?							
Jusqu'à quel point vous êtes-vous senti inconfortable que <u>d'autres</u> voient la forme de votre corps ou votre silhouette (p.ex. dans un vestiaire commun, lorsque vous allez nager ou portez des vêtements ajustés)?							

## Drive for Muscularity Scale - Muscle-oriented Behaviour subscale (DMS-MB)

S'il vous plaît, lisez chaque item attentivement et puis, pour chaque énoncé, sélectionnez la réponse qui s'applique le mieux à vous.

	Jamais	Rarement	Parfois	Souvent	Très souvent	Toujours
Je soulève des poids pour augmenter ma masse musculaire.						
J'utilise des suppléments de protéines ou d'énergie.						
Je bois des boissons (« shakes ») conçues pour prendre du poids ou des boissons protéinées.						
J'essaie de consommer le plus grand nombre de calories possible au cours d'une journée.						
Je me sens coupable si je manque une session de musculation.						
Les autres croient que je m'entraîne trop souvent avec des poids.						
Je crois que mon horaire de musculation entre en conflit avec les autres sphères de ma vie.						