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Using a Concave Critical Lens: Moving Towards an Understanding of the Non-linear Relationship Between Social Media Literacy and Body Image

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Inconsistent findings regarding the relationships among social media literacy and body image may be due to unmet assumptions of linearity. This study examined the different profiles of active social media literacy and their association with positive embodiment and indices of body image concerns. Young women (n = 975) completed an online survey assessing dimensions of social media literacy (commercial and celebrity social media literacy, social media appearance comparison frequency, and selfie-investment), positive embodiment, and dimensions of body image concerns. Findings revealed seven social media literacy profiles associated with different levels of positive embodiment and body image concerns. Interestingly, and counter to linear expectations, a cluster with low levels of social media literacy but high levels of positive embodiment and lower body image concerns emerged. The relationships among social media literacy and body image appear to not be linear, which increases understandings of processes underlying the effects of social media use.

Keywords: Social media literacy, body image, positive embodiment

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Appearance-focused social media exposure has been shown to be detrimental to young women in terms of their body image and other mental health outcomes (e.g. Becker et al., 2011; de Valle et al., 2021). Sociocultural theories of the impact of idealized media images and accompanying messages on body image outcomes allow for consideration of the potential protective role of media literacy in mitigating these effects (McLean et al., 2016b). Building on evidence supporting this contention, effective intervention strategies for preventing body image disturbance have been developed targeting media literacy skills (McLean et al., 2016b; McLean et al., 2017; Yager et al., 2013). More recently, given the documented role of social media use in body image concerns, this construct has been extended to online media content, and

theoretical and empirical work has started to focus on social media literacy as related to appearance and body image (McLean et al., 2017). Despite the usefulness of this construct as a protective factor and intervention target, a number of questions still exist regarding the conceptualization of social media literacy and its relationship with social media use and body image outcomes. In particular, it is unclear whether there is a linear relationship between social media literacy and body image concerns, or alternatively is the relationship more complex, which could account for the inconsistencies in these relationships previously documented in the context of traditional media (McLean et al., 2016b) have yet to be bridged. The aim of the present study was to examine the different profiles of social media literacy skills and body image among a sample of young women.

LITERATURE REVIEW

Theoretical relationships between social media literacy and body image

Body image is a multidimensions construct, and encompasses both feelings of dissatisfaction and negative appraisal of the body, that is body dissatisfaction, as well as positive body image. One dimension of positive body image is positive embodiment, which is a distinct construct from body dissatisfaction and represents a multifaceted experience of attunement to inner states, a critical stance towards social discourses related to appearance and embodied practices, and a capacity to live in the body and engage in embodied self-care practices (Piran, 2017). Theoretical frameworks of the role of social media literacy in protecting body image have described how these skills intervene to disrupt the pathways shown to account for the effects of social media exposure on body image (Gordon et al., 2020; Irving & Berel, 2001; McLean et al., 2016b). Media exposure and influences are held to detrimentally affect body image by providing unrealistic standards of appearance that individuals adopt as personal values through their internalization (Schaefer et al., 2017). These personal standards then serve as a reference point as individuals engage in in-the-moment appearance comparisons and estimate their proximity to appearance ideals (Schaefer & Thompson, 2018). These processes in turn lead to poor body image, as most individuals fail to meet the unrealistic appearance standards set by society. In addition, sociocultural approaches have been usefully integrated with elements of objectification theory (Fitzsimmons-Craft, 2011), highlighting how exposure to

idealized and objectifying media imagery is associated with self-objectification and poor body image. Finally, feminist and postfeminist theories have highlighted how women may be particularly susceptible to these effects due to the continued focus on appearance as a source of self-worth for women in Western societies, and the pressure on women to enact modern femininities by rendering themselves hypervisible on social media platforms (Gill, 2016).

In the context of social media, appearance comparisons may be exacerbated by the perception that the individuals portrayed in the images are peers and therefore that their appearances may be more attainable than those of typical models or celebrities. Furthermore, an additional process to consider is the taking and posting of self-images and the explicit appearance feedback received in response. The creation of self-images may be considered within a body checking framework, as this process is used to determine how one's appearance aligns with internalized sociocultural ideals (Yellowlees et al., 2019). Further, posting of self-images can be conceptualized as an extension of appearance comparison processes as the somewhat explicit goal of posting is to receive feedback from others in terms of how well one's appearance matches social standards. In this way, an individuals' investment in taking and posting self-images and the feedback received through "likes" or comments (that may be positive or less so) is another important maintenance mechanism of body dissatisfaction in the context of social media use by promoting the reliance on external feedback as a means of sustaining positive feelings about appearance, and reinforcing its centrality to self-worth (Rodgers, 2016).

The role of social media literacy

Social media literacy can be described as critical viewing and interaction skills as applied to social media content (McLean et al., 2017). Based on the extension of these skills from the context of traditional media, these include the capacity to critically evaluate images and identify both their unrealistic nature as well as their deliberate intent to reflect socially constructed appearance ideals (Tiggemann, 2022). In addition, these skills include the capacity to understand the objectives of individuals when posting social media content, be it commercial or self-promotional, the ways in which algorithms contribute to individually-tailored content, and an awareness of the ways in which social media use may affect individuals. Finally, social media literacy can also be thought of in

regard to the skills that can be used to minimize negative effects of social media. This includes use of online behaviors, deliberate consumption of certain content, and protective filtering and cognitive and emotional strategies such as reminding oneself that content is curated or that one holds certain personal values other than the pursuit of appearance ideals (Gordon et al., 2020; Paxton et al., 2022).

Thus, high levels of social media literacy would be evidenced by an individual describing a high awareness of self-presentation intent of own and others' posting on social media and the subsequent response that they do not constitute appropriate comparison targets due to being heavily edited and manipulated (McLean et al., 2017). Thus, social media literacy would theoretically be manifested by individuals who also describe engaging in few appearance comparisons on social media, due to this recognition. Furthermore, consistent with the conceptualization of investment in curating self-images and selective online self-presentation and receiving positive feedback being maintenance mechanisms for body dissatisfaction, high levels of social media literacy would also theoretically be revealed by individuals putting less effort into the creation of an idealized profile and being less concerned about receiving positive reinforcement related to their self-images.

Regarding the relationships with body image outcomes, media literacy is described as reducing the extent to which appearance standards are internalized through increased awareness that these are unachievable (Irving & Berel, 2001). In doing so, and through the disruption of the maintenance mechanisms as described above, media literacy is believed to be associated with lower levels of body dissatisfaction and self-objectification. Furthermore, social media literacy would be expected to be associated with a lower emotional impact of appearance comparisons, due to the knowledge that even if the comparisons are upwards (i.e., unfavorable) this reflects the unrealistic nature of social media images. Moreover, social media literacy may be associated with higher levels of positive embodiment (Piran, 2017). Positive embodiment has been shown to be associated with lower levels of body image concerns, including self-objectification as well as disordered eating behaviors (Piran et al., 2020). Thus, higher social media literacy skills would be expected to be associated with a range of lower body image concerns and more positive embodiment.

Empirical evidence supporting the relationships between higher social media literacy and more positive body image is still scant. However, partial support for the relationships between higher media literacy and improved body image in the context of traditional media does exist, although findings are not fully consistent. A systematic review focused the relationship between traditional media literacy and body dissatisfaction and disordered eating highlighted how only two of the seven cross-sectional studies included found support for the hypothesized relationship between higher media literacy and lower levels of body dissatisfaction and eating concerns (McLean et al., 2016b). Preliminary support for some of these relationships has also emerged in the context of social media. Specifically, young women with higher media literacy skills reported lower levels of appearance comparisons and internalization of the tanned idea after exposure to social media images of tanned models (Mingoia et al., 2020). Thus, although inconsistent, some evidence has emerged for the potential protective role of media literacy in body image.

Reconceptualization of relationships between social media literacy and body image

Past work, however, has relied on a conceptualization of (social) media literacy as being linearly associated with body image concerns, such that individuals with low levels of media literacy would report the highest levels of body image concerns, and those with the highest levels of media literacy would report the lowest body image concerns and most positive body image. Such a conceptualization neglects to account for the process of acquisition of (social) media literacy skills, and the reasons for this acquisition. In the context of social media specifically, it is likely that some individuals using social media who have low body image concerns and high positive body image, may also have low levels of social media literacy skills.

Theories of active social media use would predict that individuals with low investment in and concerns about their appearance would seek out (social) media content that is not highly appearance-related (Katz et al., 1973; Rodgers et al., 2020). Thus, although idealized content is ubiquitous, due to their preferences for media to meet their needs, such individuals may be less exposed to idealized content thus needing to engage in fewer active strategies to minimize its impact. Furthermore, given their higher levels of positive body image, such individuals may already find themselves protected from the

detrimental impacts of the appearance-related content to which they are exposed, engaging in few appearance comparisons and relatively disinvested from an appearance-related online self-presentation. Such a group of individuals would likely report using few critical skills when using social media, simply because they have not needed to learn to do so.

If this perspective were supported, it would be expected that social media literacy would present not a linear relationship with indices of body image, but rather one in which high levels of social media literacy skills would be associated with lower levels of body image concerns than would be present at moderate levels of social media literacy skills. However, at the very low end of social media literacy, it would be likely to find individuals who, lacking these skills, report high levels of body image concerns, as well as those who, protected by high levels of positive embodiment and a low investment in attaining appearance ideals, report low levels of social media literacy skills yet low body image concerns. Should this be supported, it would have important implications for the field of body image in terms of theoretical conceptualization of social media literacy, measurement, as well as the targeting and evaluation of interventions aiming to increase social media literacy as a modifiable protective factor.

Aims of the present research

The aim of the present study was to test this hypothesis among young woman and explore profiles of social media literacy skills (i.e., self-reported media literacy as related to commercial and celebrity content, and indicators of social media literacy including frequency of social media appearance comparisons, and investment in self-images). We hypothesized that several profiles of social media literacy would emerge, along a continuum of social media literacy skills and that these profiles of social media literacy would be associated with varying levels of body image concerns and positive embodiment. We specifically predicted the existence of groups of young women with similarly low levels of social media literacy skills but significantly different levels of body image concerns and positive embodiment, such that a group would emerge with low social media literacy skills but low investment in social media that also would have low body image concerns and high positive embodiment. In addition, we predicted groups would emerge with high social

media literacy and low investment in social media that had low body image concerns and high positive embodiment, which would support the protective role of social media literacy.

METHODS

Participants and procedures

A sample of *n* = 975 young women were included from a broader project focused on social media and positive embodiment in the U.S. Participants were aged between 18 and 30 years, Mean (SD) = 22.64 (3.51), and indicated their gender as female. The majority (75%) of the sample identified as White, another 7% identified as Black or African-American, 10% as Latina, 2.5% as Native America, 0.4% as Native Hawaiian or Pacific Islander, and the rest as other. Targeted recruitment was conducted to include participants with both high levels of positive embodiment and low embodiment using different advertisements that alternately called for young women with appearance concerns, and those without. All participants provided informed consent before accessing an online survey as part of the broader study. The study was approved by the Institutional Review Board of Northeastern University.

Measures

Social Media Literacy

Commercial and celebrity social media literacy. Participants' critical awareness skills when viewing commercial and celebrity produced social media content was assessed using two subscales. Based on previous scales that have successfully captured traditional media literacy (Irving et al., 1998; McLean et al., 2016a), 10 items assessed critical awareness skills as related to commercially produced social media content, and 6 items assessed those skills as related to celebrity created social media content. An example commercial content-related item was "I know media messages are trying to convince me to do or buy something." An example item for the celebrity produced content was "I notice that I think about the reasons behind celebrities' posts." Items are rated on a 4-point scale ranging from 1 = *Never* to 4 = *Always,* with higher scores indicating greater critical awareness skills. In the current sample, both the commercial and the celebrity subscales had acceptable internal reliability with α = .81, and α = .75, respectively.

Selfie investment. Participants' investment in their own self-images was assessed using 8 items (McLean et al., 2015) that are presented along a visual analogue scale from

zero to 100 and were anchored by opposing statements such as "It's easy to choose the photo" and "It's hard to choose the photo". The mean for items was calculated for the total scaled score, and then divided by 10 to reduce it to a more similar range to the other indices of social media literacy, with higher scores representing higher investment in photo curation and sharing on social media. Internal consistency for this scale was good in the current sample (α = .81).

Social media comparison frequency. The extent to which participants engaged in appearance comparisons with other young women on social media and evaluate the posts of other was assessed through six questions rated on a 6-point scale ranging from 1 = *Never* to 6 = *Always*, with higher scores indicating more frequent engagement in appearance comparisons. An example item is "I compare my appearance to the appearance of other girls I know that I see on social media." In the current sample the internal reliability was acceptable, with α = 79.

Body Image

Positive embodiment. The Experience of Embodiment Scale (Piran & Teall, 2012) assesses the quality of a woman's experience of inhabiting her body as she engages in the world. The scale includes 34 items across 6 subscales (Positive Connection with the Body, Body Disrupted Adjustment Agency and Expression, Experience and Expression of Sexual Desire, Self-care and Attunement versus Body Harm and Neglect, and Countering Self-Objectification). Items are scored on a 5-point scale of agreement ranging from 1 (strongly disagree) to 5 (strongly agree). However, here the total score was utilized, and the internal validity was found to be acceptable (α = .93).

Body dissatisfaction. The Body Dissatisfaction subscale of the Eating Disorders Inventory – 3 (Garner, 2004) was used to assess feelings of body dissatisfaction. The 10 items are scored on a 6-point scale ranging from 1 = *Never* to 6 = *Always,* with higher scores indicating greater body dissatisfaction. An example item is "I think my stomach is too big." In the current sample, the internal reliability was acceptable with (α = .87).

Drive for thinness. The Drive for Thinness subscale of the Eating Disorders Inventory – 3 (Garner, 2004) was used to assess striving for a slender body. The 7 items are scored on a 6-point scale ranging from 1 = *Never* to 6 = *Always,* with higher scores

indicating greater drive for thinness. An example item is "I am terrified of gaining weight." In the current sample, the internal reliability was acceptable with (α = .92).

Thin-ideal internalization. Internalization of the thin-ideal was assessed using the Internalization-Thin/Low Body Fat subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (Schaefer et al., 2017). The four items of this subscale are rated on a 5-point scale ranging from 1 = *Definitely disagree* to 5 = *Definitely agree*, with high scores indicating greater endorsement of the thin-ideal. An example item is "I think a lot about looking thin." The internal consistency in the present sample was acceptable (α =.80).

Self-objectification. Self-objectification was assessed using the Objectified Body Consciousness Scale (McKinley & Hyde, 1996). The total scale includes 24 items scored on a 6-point scale ranging from 1 = Strongly disagree to 6= Strongly agree, with higher scores indicating high levels of objectified consciousness. An example item is "During the day, I think about how I look many times." In current sample the internal reliability was acceptable, with α =.84.

Negative impact of social media appearance comparison. The detrimental consequences of appearance comparisons with social media images were captured through 7 items developed by McLean et al. (2017). The items are rated on a 4-point scale ranging from 1 = *Strongly disagree* and 4 = *Strongly agree,* with higher scores indicating more negative impacts of social media appearance comparisons. An example item is "I felt mostly sad and depressed." In the current sample, internal reliability was acceptable (α = .91).

Selfie-manipulation. Participants' tendency to edit and manipulating their own self-images was assessed using a 10-item scale assessing the frequency with which participants reported engaging in editing practices such as removing red eyes, or improving their skin tone (McLean et al., 2015). Items are rated on a 5-point scale ranging from 1 = *Never* to 5 = *Always* with higher scores indicating levels of engaging in modification behaviors. In this sample, internal reliability was acceptable with (α = .85).

Data analysis

Outliers were adjusted to the nearest value within range. A k-means cluster procedure was conducted to examine subgroups according to indices of social media

literacy. Variables were not standardized as this has not been found to yield substantial benefits in terms of the stability of cluster structures (Steinley, 2006) The number of clusters to retain was decided based on multiple factors, including the convergence of the cluster solution indicated by the change in cluster centers being null or close to zero, the size of clusters and the significant difference in included variables across clusters (Khan & Ahmad, 2004; Steinley, 2006). Thus, for example, solutions were considered only if the size of all clusters were deemed to the meaningful. Four variables were entered to determine the clusters: commercial media literacy, celebrity media literacy, appearance comparison frequency, and selfie-investment. Differences in clustering variables were tested across clusters using post-hoc Tukey tests. To test for differences in positive embodiment and body image concerns across the clusters, an initial multivariate analysis of variance was conducted, and significant findings were followed-up with within construct two by two post hoc tests. Six indices of body image were utilized: positive embodiment, body dissatisfaction, drive for thinness, thin-ideal internalization, and self-objectification.

RESULTS

Cluster generation

The k-means clustering process revealed that a 7-cluster solution was the best fit to the data. Convergence was achieved after 22 iterations after which no further changes were present in cluster centers. With this solution, the smallest cluster included n = 72 individuals with the largest including n = 229. Descriptive statistics for the clustering variables across clusters are provided in Table 1.

Cluster Interpretation

The clusters were interpreted based on relative scores on the clustering variables. Thus, the first cluster (n = 141) that included individuals with the lowest levels of commercial and celebrity social media literacy, as well as somewhat high selfie investment and appearance comparison (though not the highest levels of these latter two) was described as “Naïve” in that these individuals seem to be without any critical lens with regard to social media.

The next cluster (n = 88) was described as “Indifferent” and included individuals who were similarly low in commercial and celebrity social media literacy but reported

significantly less frequent appearance comparison frequency and selfie-investment suggesting their low levels of critical skills were perhaps less problematic given their lack of investment.

The third cluster (n = 169) was named "High investment" and included individuals with slightly higher levels of commercial and celebrity social media literacy as compared to the Naïve and Indifferent clusters but also significantly higher frequency of appearance comparisons and greater selfie investment. This cluster presented the combination of dimensions likely to confer the highest risk in terms of body image when using social media. The fourth cluster (n = 229) was named "Invested with lower comparison" and differed from the "high investment" cluster principally in that the frequency of appearance comparison was lower. The fifth cluster (n = 180) was described as "Emerging literacy" and included individuals reporting significantly higher levels of commercial and celebrity social media literacy than the "High investment" and "Invested" with lower comparison clusters, as well as lower frequency of appearance comparison and lower levels of selfie investment. The sixth cluster (n = 96) was named "High literacy" and included individuals with higher levels of commercial media literacy as compared to the Emerging literacy cluster, but also less frequent appearance comparisons and lower selfie investment.

Finally, the last cluster (n = 72) was termed "Skeptical" and included those with the highest levels of commercial and celebrity social media literacy and significantly less frequent appearance comparisons and lower selfie investment as compared to almost all the other clusters. Thus, this cluster seemed likely the most protected from the effects of social media use on body image.

Differences Among Clusters in Social Media Literacy

The ANOVA analysis revealed significant differences between the clusters on each of the four clustering variables (all *p*s <.001). Post hoc two by two tests were conducted to examine significant differences between all the clusters on the clustering variables. As described above, many significant differences were found among the clusters, with an overall pattern of commercial and celebrity social media literacy increasing as appearance comparison frequency and selfie investment decreased. These findings are also presented in Table 1.

Body Image Profiles of Social Media Literacy Clusters

The findings from the multivariate analysis of variables using the combined dependent variables: positive embodiment, body dissatisfaction, thin-ideal internalization, drive for thinness, self-objectification, negative impact of social media appearance comparison, and selfie modification revealed an overall effect of cluster membership, Pillai's Trace = .50, $p < .001$. Moreover, between-subject tests revealed that each of the body image dimensions varied significantly according to cluster membership (all *ps* <.001), therefore, follow-up comparisons were conducted to examine significant between-cluster differences.

The findings from the post hoc comparisons are presented in Table 2. Overall, the High investment cluster emerged as the group with the poorest body image, as illustrated by significantly lower positive embodiment, and significantly higher indices of negative body image as compared to all of the other clusters. In contrast, the Skeptical cluster presented higher levels of positive embodiment as compared to all of the other clusters, and significantly lower levels of indices of body image concerns than almost all clusters across the different indices.

Of particular interest, the Naïve and Indifferent clusters significantly differed from each other across most indices of body image. Specifically, the Indifferent cluster presented significantly higher positive embodiment, lower body dissatisfaction, lower drive for thinness, lower thin-ideal internalization, lower self-objectification, and lower negative impact of appearance comparisons. The Invested with lower comparison, Emerging literacy, and High literacy displayed patterns that were overall consistent with their increasing levels of social media literacy. Thus, they significantly differed in levels of positive embodiment, such that positive embodiment increased with levels of social media literacy. Similarly, significant differences were present among the three clusters on thin-ideal internalization, self-objectification, and the impact of appearance comparisons with higher levels of these indices associated with lower levels of social media literacy. Similar, although less consistent patterns were present for body dissatisfaction, drive for thinness, and selfie manipulation.

Table 1
Clusters and means (standard deviations) for the included variables

	Cluster A Naïve (low SML) (N = 141)	Cluster B Indifferent (low SML & investment) (N = 88)	Cluster C High investment (low SML) (N = 169)	Cluster D Invested with lower comparison (N = 229)	Cluster E Emerging literacy (N = 180)	Cluster F High literacy (high SML) (N = 96)	Cluster G Skeptical (high SML) (N = 72)
Commercial social	26.71 (3.15)	28.05 (3.08)	29.97 (4.29)	31.02 (406)	34.39 (3.01)	36.15 (2.66)	34.83 (3.65)
media literacy	C, D, E, F, G	C, D, E, F, G	**A, B**, E, F, G	**A, B,** E, F, G	**A, B, C, D, F**	**A, B, C, D, E**	**A, B, C, D**
Celebrity social	13.84 (3.02)	14.28 (2.95)	16.43 (3.72)	16.55 (3.10)	17.73 (2.66)	18.01 (3.30)	17.26 (3.25)
media literacy	C, D, E, F, G	C, D, E, F, G	**A, B**, E, F	**A, B**, E, F	**A, B, C, D**	**A, B, C, D**	**A, B**
Appearance	20.65 (3.50)	16.56 (1.48)	23.95 (3.85)	21.83 (3.88)	19.30 (4.04)	17.10 (4.01)	15.02 (3.70)
comparison frequency	**B**, C, **E, F, G**	A, C, D, E	**A, B, D, E, F, G**	**B, C, E, F, G**	A, **B,** C, D, **F, G**	A, C, D, E, G	A, C, D, E, F
Selfie-investment	50.22 (3.47)	37.38 (4.07)	71.82 (4.15)	60.53 (3.26)	47.80 (3.74)	36.70 (3.38)	22.22 (5.33)
	B, C, D, E, F, G	A, C, D, E, **G**	**A, B, D, E, F, G**	**A, B**, C, **E, F, G**	A, **B**, C, D, **F, G**	A, C, D, E, **G**	A, B, C, D, E, F

Note: In each cell, the letters shown indicate the clusters that differ significantly from the cluster in the column header on the variable. Bolded letters indicate clusters whose levels were significantly lower than the cluster in the column header, while unbolded letters indicate clusters whose levels were significantly greater on the variable of interest than the cluster in the column header.

Table 2

Means (standard deviations) and Cluster Differences For Body Image Variables

	Cluster A Naïve (low SML) (*N*= 141)	Cluster B Indifferent (low SML & investment) (*N*= 88	Cluster C High investment (low SML) (*N*= 169)	Cluster D Invested with lower comparison (*N*= 229)	Cluster E Emerging literacy (*N*= 180)	Cluster F High literacy (high SML) (*N*= 96)	Cluster G Skeptical (high SML) (*N*= 72)
Positive embodiment	110.68 (18.14)	126.48 (16.85)	94.18 (19.05)	106.62 (17.85)	118.98 (18.11)	126.72 (18.17)	137.58 (17.38)
	B, **C,** E, F, G	**A, C, D, E**, G	A, B, D, E, F, G	B, **C,** E, F, G	A B, C, D, F, G	**A**, **C, D**, **E**, G	**A, B, C, D, E, F**
Body dissatisfaction	35.81 (8.28)	29.25 (7.83)	41.05 (9.57)	37.33 (8.45)	32.09 (9.19)	30.12 (10.11)	26.04 (9.60)
	B, C, **E, F, G**	A, C, D	**A, B, D, E, F, G**	**B,** C, **E, F, G**	A, C, D, **G**	A, C, D	A, C, D, E
Drive for thinness	22.87 (7.70)	18.85 (7.05)	29.33 (9.78)	25.95 (8.16)	21.65 (8.36)	19.17 (8.56)	15.56 (7.38)
	B, C, D, F, G	A, C, D	**A, B, D, E, F, G**	**A, B**, C, **E, F, G**	C, D, **G**	A, C, D,	A, C, D, E
Thin-ideal	16.63 (3.85)	14.42 (3.52)	18.57 (4.57)	17.64 (3.62)	15.51 (4.43)	13.38 (4.56)	11.89 (4.29)
internalization	**B**, C, **F, G**	A, C, D, **G**	**A**, **B**, **E, F, G**	**B, E, F, G**	C, D, **F, G**	A, C, D, E,	A, B, C, D, E
Self-objectification	91.27 (12.00)	82.24 (11.06)	102.72 (13.87)	95.36 (11.98)	85.60 (14.37)	80.95 (15.22)	73.07 (14.17)
	B, C, **E, F, G**	A, C, D, **G**	**A, B, D, E, F, G**	**B, C, E, F, G**	A, C, D, **G**	A, C, D, **G**	A, B, C, D, E, F
Negative impact of	15.47 (3.71)	12.71 (3.27)	18.76 (4.22)	16.39 (3.90)	14.06 (3.60)	12.44 (3.27)	10.22 (2.99)
appearance comparison	**B**, C, **E, F, G**	A, C, D, **G**	**A, B, D, E, F, G**	**B**, C, **E, F, G**	A, C, D, **F, G**	A, C, D, E, **G**	A, B, C, D, E, F
Selfie manipulation	20.92 (7.13)	18.39 (4.76)	27.35 (8.55)	22.30 (7.00)	19.57 (6.11)	17.60 (5.93)	15.79 (4.92)
	C, **F, G**	C, D,	**A, B, D, E, F, G**	**B, C, E, F, G**	C, D, **G**	A, C, D	A, C, D, E,

Note: In each cell, the letters shown indicate the clusters that differ significantly from the cluster in the column header on the variable. Bolded letters indicate clusters whose levels were significantly lower than the cluster in the column header, while unbolded letters indicate clusters whose levels were significantly greater on the variable of interest than the cluster in the column header.

DISCUSSION

The aim of this study was to explore profiles of social media literacy among young women and relationships between these profiles and body image concerns and positive embodiment. Specifically, the aim was to test the hypothesis that both higher and lower levels of body image concerns and positive embodiment could be found among those reporting low social media literacy skills. In addition, it was hypothesized that those with the highest levels of social media literacy would report lower body image concerns and high positive embodiment consistent with the theorized protective effect of these skills (Paxton et al., 2022). Together, the findings provide support for the existence of these groups. These findings support the usefulness of moving away from linear conceptualizations of the relationships between social media literacy and body image and considering the complex bidirectional relationships that likely exist among the development of these skills and body image dimensions. The general trend towards higher social media skills being associated with more positive body image and lower concerns also provides additional support for the usefulness of targeting social media skills in interventions aiming to decrease the detrimental effects of exposure to highly visual social media on body image (Gordon et al., 2020; Saiphoo & Vahedi, 2019).

The first aim of this study was to explore the profiles of social media literacy skills among a sample of young women. It was expected that multiple profiles of social media literacy skills would emerge when conceptualizing social media literacy as from an active cognitive, emotional, behavioral standpoint including self-reported commercial and celebrity media literacy and critical awareness skills, as well as the frequency of engaging in social media appearance comparisons and investment in online self-presentation. This hypothesis was supported, and findings from the cluster analysis identified seven different profiles of social media literacy skills. Importantly, these profiles varied in terms of their levels of self-reported social media literacy as well as their behavioral and emotional indices of social media literacy. Furthermore, in support of our overarching hypothesis, the two profiles with the lowest levels of self-reported critical media awareness skills reported significantly different levels of behavioral and emotional indices, with the profile termed "Naïve" reporting somewhat frequent engagement in appearance comparisons on social media (the second highest levels after the "High investment" profile) and moderate level of investment in their online self-presentation, while the "Indifferent" cluster reported some

of the lowest frequency of social media appearance comparison and investment in online self-presentation. These findings support the suggestion that at low levels of what is traditionally assessed in terms of social media literacy skills, some individuals reveal emotional and behavioral indices consistent with low social media engagement and influence. This contrasts with the traditional assumption that individuals with low levels of social media literacy skills would report negative effects of its use.

The second aim of this study was to examine differences across social media literacy profiles in terms of body image, conceptualized using indices of body image concerns (thin-ideal internalization, self-objectification, body dissatisfaction, drive for thinness), positive embodiment, as well as theoretical maintenance mechanisms including the impact of appearance comparisons, and engagement in self-image improvement practices. Consistent with the theorized disruptive pathways through which social media literacy is understood to be related to more positive body image (McLean et al., 2016b), our findings revealed significant differences across social media literacy profiles on these indices. Thus, individuals in the "High investment" profile were found to report the greatest social media appearance comparisons, manipulation of self-image, and body image concerns, and the lowest levels of positive embodiment. While this group reported slightly higher social media literacy skills than the "Naïve" and "Indifferent" groups, they also reported poorer behavioral and emotional indices of social media literacy (higher frequency of social appearance comparisons and greater investment in their online self-presentation). Due to the cross-sectional nature of the data, it is not possible to examine the direction of these relationships, but it seems likely that the slightly higher levels of self-reported social media literacy skills in the High investment group compared to the "Naïve" and "Indifferent" groups are due to these individuals' greater efforts to protect themselves from the detrimental effects of their social media use, in the context of their high body image concerns. This profile represents the most negatively impacted group in terms of social media use, which may maintain or exacerbate their body image concerns.

Consistent with understandings that social media literacy operates to protect body image by disrupting maintenance mechanisms and more distal risk factors for body image concerns (McLean et al., 2016b), the profiles identified in our sample with increasing levels of social media literacy skills, i.e. the "Invested with lower comparison", "Emerging

literacy", "Higher literacy", and "Skeptical" profiles, displayed decreasing levels of body image concerns and increasing levels of positive embodiment. Interestingly, although the emerging literacy and high literacy profiles differed significantly in terms of celebrity social media literacy skills and emotional and behavioral social media literacy skills, they were overall similar in terms of body images indices save for their engagement in manipulation of their own self-images, with the emerging literacy profile reporting more photo manipulation. In contrast, the skeptical profile with the highest overall levels of social media literacy reported significantly better body image across indices.

Taken together, these findings suggest that social media literacy is variable among young women, and evidence was found for an overall trend of higher social media literacy skills being related to improved body image, supporting the usefulness of targeting social media literacy in prevention and intervention efforts including among young adult women (Gordon et al., 2020; McLean et al., 2017). These interventions would seem particularly useful for young women represented here in the "Naïve" profile who seem to lack these skills. However, findings also supported the idea that for some young women, low social media literacy may not be accompanied by body image concerns, but rather higher levels of positive embodiment.

These findings have important theoretical and practical implications. From a theoretical perspective, findings interrogate the developmental sequence through which social media literacy skills, body image concerns, and positive embodiment develop. The cross-sectional nature of these data limit further exploration of this here. However, the theoretical background of the positive theory of embodiment suggests that as girls reach pre-adolescence and then puberty, positive embodiment that was present is eroded by oppressive gendered social practices. These practices lead adolescent girls to feel unsafe in their bodies and seek to monitor them for their conformity to appearance ideals as well as discipline their bodies, and themselves, into taking up little space (Piran, 2017). Body image concerns that have been shown to be present in very young girls (Rodgers et al., 2017; Spiel et al., 2012) may be exacerbated during early adolescence (Rodgers et al., 2016). Social media use may also start around this time, with most platforms currently requiring users to be 13 years or older to create accounts (O'Keeffe & Clarke-Pearson, 2011). As such it coincides with the erosion of positive body image and the increase in body image concerns. Social media literacy skills may then be acquired and needed to protect

body image. Our findings suggest that for a small group of young women (in particular those in the "Indifferent" group), body image concerns never reach levels that warrant the implementation of social media literacy skills, or that at the time when these data were collected, these young women had moved through the period of adolescence and found means of engaging with social media and maintaining positive embodiment such that they were no longer actively needing to use critical awareness skills. Thus, the apparent indifference may for some indicate existing resiliency to body image concerns, and socialization around appearance centrality. Most likely, this is not however a group in which active resistance is very strong, as resistance necessarily follows awareness, and thus may be more characteristics of the "Skeptical" profile.

From a practical perspective, these findings suggest that future explorations of the role of social media literacy in body image and the evaluation of interventions that aim to modify this potentially protective dimension should consider that the relationships between social media literacy and body image may not be linear. This needs to be taken into account in methodological approaches (Jarman et al., 2022). Moreover, these findings suggest that positive embodiment and low investment in appearance may for some be sufficiently protective that effortful protective processing of media is not necessary, and that for such individuals engaging them in media literacy skill building may not be useful. In addition, it would be valuable to better understand the developmental embodied journey of these young women to better identify the protective and resilience factors that have allowed them to maintain high positive embodiment, and to learn about how they use social media.

The individuals grouped in the "High investment" profile who reported some social media literacy skills, but the lowest levels of emotional and behavioral social media literacy indices, and the poorest body image represent a group of particular interest in terms of intervention. Further work among individuals at this stage of social media use, including qualitative work, would help to elucidate why or how their critical awareness skills do not translate to the emotional and behavioral indices of social media skills that may be most helpful for body image, and how to more usefully provide resources. Given these data are cross-sectional, it is also possible that this represents a transition phase, and that critical awareness skills precede their application in the moment when using

social media. However, it is also possible that for this group, very high body image concerns and low levels of embodiment override the protective effect of critical awareness skills and are insufficient in the face of idealized social media content. It may be that for this group, approaches that can combine changes in social media use as well as interventions more directly targeting body image and accompanying concerns are needed.

The findings of this study have implication for theory and practice. From a theoretical perspective they highlight the need to develop more complex frameworks for grounding the relationships among social media literacy and body image that account for how and why social media literacy skills develop. A particularly important point seems to be the timing of the acquisition of social media literacy skills in the context of social media use initiation as well as the trajectory of body image over the course of childhood and adolescence. It will be important to focus on refining and testing theoretical models that can account for the different profiles evidenced here. In addition, from an intervention and practice perspective the present findings suggest considering social media literacy skills as a proxy for positive or problematic social media use, may not be useful. Indeed, those who critical social media literacy skills are low may not all in fact be at risk of poor body image, not need or benefit from training in such skills. In terms of intervention evaluation, the findings also suggest that examinations of the effects of interventions of critical social media literacy skills as a mechanism for improving body image should account for the fact that those with low initial levels in social media literacy may not all show improvements in body image due to initially high levels. This call for thoughtful design of intervention evaluation plans.

This study presents a number of limitations. First, the sample was not a generalizable one given that women at either end of the positive embodiment spectrum were deliberately targeted to obtain sufficient representation of these groups. While this limits generalizability to a general population, it also, however, ensured that the study was adequately powered for statistical minority groups with highest and lowest levels of body image concerns and social media literacy skills to be identified. It should not be assumed therefore, that the proportions of participants represented in the different profiles that emerged here are representative of the distribution in the general population, but it seems reasonable to believe that these minority groups do indeed exist. Second, our study relied exclusively on self-report measures of social media literacy and body image. It

would be interesting in future to explore whether the identified subgroups present differences in their reactions to social media content in the context of experimental exposure designs. A further limitation lies in the fact that we did not assess which types of social media participants generally consumed, which would have been another interesting element to consider. Furthermore, findings were cross-sectional, and further exploration of the relationships between body image, social media literacy, and social media use using longitudinal designs is warranted. Finally, the present study included young women aged 18-30 years meaning that it was not possible to tell whether for some young women positive embodiment had always been present or followed a distancing from puberty and potentially appearance-focused environments such as college, and reevaluation of values. Future developmental work that is able to identify the processes underlying the development of body image concerns and positive embodiment over time should be conducted.

In conclusion, the findings from this study provide support for the fact that social media literacy skills are variable among young women, and that while the general trend is for higher levels of social media literacy to be associated with lower body image concerns and higher positive embodiment, these relationships may be best conceptualized as non-linear. These findings support the usefulness of targeting social media skills in interventions aiming to decrease the detrimental effects of exposure to highly visual social media on body image. However, findings also call for further theoretical and empirical work, and particularly additional work among girls and young adolescents as they start to use social media to better understand the dynamic relationships among social media use, social media literacy, and body image.

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