

# Social Contagion, from Suicide to Online Challenges to Eating Disorders: Current Research and Harm Mitigation Strategies for Youth Online

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## 1 Introduction

The growth of social media sites has rapidly changed the way that people interact with one another online, especially for adolescents and young adults who are the primary users of social media in the United States (Carlyle et al. 2018). Ninety-six percent of teenagers report having consistent access to a smartphone and have been shown to use a larger number of social media platforms than in years past (Roth et al. 2020). In the US, 86% of people use at least one social media platform, and 85% of children 12- to 17-years old report regular social media use (Carlyle et al. 2018; Chung et al. 2021). Given their frequent use of social media, of specific concern are sites that facilitate the promotion of risky behaviors. For example, viral trends on platforms like TikTok and Twitter, in which users are encouraged to engage in non-normative behaviors, are increasingly common, some of them promoting the performance of risky acts (Abraham et al. 2022). In addition to potentially dangerous trends, there has been a rise of online communities dedicated to the promotion of self-harming behaviors that offer community, tips, and support in continuing to participate in damaging behavior (Knapton 2013).

One subtype of this phenomenon revolves around the promotion and perpetuation of eating disorder “ideology” and behaviors, such as glorifying images of extreme thinness, spreading tips on how to purge, and posting diet-based challenges that encourage users to engage in food restriction or calorie counting (Sharpe et al. 2011). Concerns about the accessibility of this information, coupled with increasing rates of mental health distress among adolescents, prompted the American Psychological Association to issue a recommendation specifically around it: “To reduce the risks of psychological harm, adolescents’ exposure to content on social media that depicts illegal or psychologically maladaptive behavior, including content that instructs or encourages youth to engage in health-risk behaviors, such as self-harm (e.g., cutting, suicide), harm to others, or those that encourage eating-disordered behavior (e.g., restrictive eating, purging, excessive exercise) should be minimized, reported, and removed; moreover, technology should not drive users to this content” (American Psychological Association 2023).

The pro-ED (eating disorder) virtual landscape poses a complicated issue for mental health and public health professionals. While there are some positive aspects to these online spaces, such as providing a forum for people to vent and form a community around a typically taboo subject, often instead of finding support for recovery, individuals encounter more support for prolonging the eating disorder (Brady 2014). Eating disorders are often accompanied by intense identity instability or distress, especially in adolescents (Yang et al. 2018). Social media is now a powerful tool for identity-building and acts as a

proxy by which to try out new personas and values, given the privacy online anonymity affords (Charland 2015). For those experiencing eating disorder behaviors, a site that offers identity-building around these behaviors can become extremely alluring, especially if it relieves distress by providing an outlet for experimenting with socially unaccepted identities (Charland 2015).

While there are clear drawbacks for youth being exposed to this kind of content, there is also clear motivation as to why a user might be drawn to engage in these spaces (Brady 2014). Much of the existing research on the mitigation of problematic social contagion via “traditional” media surrounds suicide contagion, and has unknown applicability to social media sites, specifically pro-ED sites. While some guidelines do exist specifically for social media platforms in regard to suicide contagion, disseminating this information has proven to be a challenge (Orygen 2023; Sumner, Burke, and Kooti 2020). Many questions have been raised about how to address this rising public health concern in ways that do not push users further toward potentially harmful content (Roth et al. 2020). Some have suggested algorithm adjustments, encouraging platforms to funnel recovery content toward users that have a history of visiting or interacting with pro-ED content to encourage engagement with recovery-positive ideologies (LaMarre and Rice 2017). Others endorse adjustments on the part of social media apps themselves in the way of content restrictions, bans, and warnings prior to viewing, and even the potentiality of real-time mental health support as users visit possibly problematic content (Sharpe et al. 2011). Outside of social media platforms making changes, other options include spreading awareness for parents, healthcare providers, and the adolescents themselves, in order to mitigate and counteract effects of social contagion (Sharpe et al. 2011; Padín et al. 2021). While there are no simple answers, looking at current research offers several suggestions on directions to take in tackling this complex issue.

In this article, we broadly explore research on contagion as it relates to suicide and how this established body of work can be referenced to help understand less-examined phenomena such as the spread of eating disorder content online and contagion behaviors related to online challenges. We then spend time describing some of the mechanisms (identity formation, social comparison, cultural influences, etc.) that quite likely contribute to contagion online and also make it very nuanced and complex. After elaborating on the complicated interactions between disordered eating behaviors and social media engagement, we explore a potential path forward, which includes calling for more advocacy from the broader public health community, establishing a code of conduct for social media producers, pursuing more research into this complex phenomenon, and adopting a comprehensive set of interdisciplinary guidelines for minimizing contagion.

## 2 Social Contagion and Suicide

Social contagion is a phenomenon defined as “the spread of behaviors, attitudes, and affect through crowds and other types of social aggregates from one member to another” (Martínez, Jiménez-Molina, and Gerber 2023). Some have attributed the spread of various harmful behaviors and attitudes to social contagion, such as violent tendencies, risk-taking behaviors, suicidality, and eating disorders (Martínez, Jiménez-Molina, and Gerber 2023; Abraham et al. 2022; Hilton 2018). Research surrounding the phenomena of social and behavioral contagion has been well established, rooted specifically in observed clusters of suicidality (Guidry et al. 2021). These clusters occur within a short time span or close geographic proximity, and have been attributed to the Werther effect, colloquially known as suicide contagion (Swedo et al. 2021): the spread of either suicidal ideation or suicide attempts, often linked to media exposure and reporting about the topic (Guidry et al. 2021; Swedo et al. 2021). This effect attributes an increase in

suicide deaths to the reporting coverage of suicides, often of well-known figures such as celebrities, and places a high importance on examining the mechanisms behind this effect and identifying potential prevention measures (Fahey, Matsubayashi, and Ueda 2018).

It has been proposed that around one-third of suicide cases in the United States follow the circulation of a suicide death in the media (Abrutyn and Mueller 2014). The connection between media reporting and suicide is certainly salient, but also nuanced and difficult to view in black-and-white terms, as there is a potential for both harmful or helpful outcomes depending on how the coverage is handled. In contrast to the Werther effect, a phenomenon known as the Papageno effect has been identified (Ng, Panirselvam, and Chan 2021). This refers to the potential for media's positive effect in lowering risk for suicide, when messaging aids in giving the public helpful knowledge that can lead to seeking help, improving literacy surrounding mental health issues, combating harmful myths around suicidality, and providing a platform for discussion and resource provision (Ng, Panirselvam, and Chan 2021).

To address this complex topic, global organizations have made attempts to standardize preventative guidelines for media professionals (Guidry et al. 2021; Robinson et al. 2018). The World Health Organization has provided guidelines for responsible reporting on suicide that include recommendations to provide accurate information and promote resources to those who may be struggling, and to avoid sensational language and descriptive details. In order to mitigate these potential risks, mental and public health professionals engage media representatives in training, partnering with organizations to promote the reporting guidelines, providing early education to journalism students, and even in some cases using an incentive structure (Ng, Panirselvam, and Chan 2021).

However, as stated, even with these guidelines, problematic content appears in media reporting on suicide with regularity. Characteristics like sensationalizing the death, going into detail about the method of suicide, and displaying graphic material are common in reporting due to their tendency to pique interest and facilitate detailed reporting (Guidry et al. 2021; WHO & IASP 2017). The guidelines recommend using concrete headlines, providing resources along with the story, describing suicide as a public health issue, and using less sensationalized verbiage and accurate data (Pescara-Kovach and Raleigh 2017). While these evidence-based guidelines are published, they are also largely considered voluntary on the part of the media producers, a hurdle that can be difficult to overcome, as publishing more detailed and graphic information often leads to increased engagement and views, which has the potential to cause a contagion effect (Ng, Panirselvam, and Chan 2021). While this is an ongoing issue, new tools are being developed to help guide media companies toward more responsible reporting. One of these is the "Tool for Evaluating Media Portrayals of Suicide," or TEMPOS, published in 2022. TEMPOS was developed to be a rating tool that both acknowledges complexities in discussions and reporting around suicide and provides guidance to media professionals on how they can make their reporting safer (Sorensen et al. 2022).

Much of the current research focuses on traditional media outlets in relation to suicide contagion, such as (print or TV) news coverage, journal articles, or magazines. While media organizations often attempt to follow established guidelines for safe suicide reporting, there is much less oversight when it comes to the spread of news and suicide deaths on social media. In 2021, 48% of American adults reported accessing news either "often" or "sometimes" from social media, making this lack of regulation of content guidelines an important issue (Walker and Matsu 2021). Outside of exploring suicide contagion, other potentially harmful subjects, such as eating disorders or self-harm, are not specifically addressed within these guidelines. On social media platforms, a majority of the content is produced and curated by the general public, who may be unaware of

the risk or that guidelines exist (Guidry et al. 2021). This makes it incredibly difficult to monitor, or to cultivate realistic guidelines to minimize harm.

### 3 Social Media and Identity

The use of social media has allowed for an adaptation in the way adolescents are afforded opportunities for identity development. Online, one has the ability to create what is referred to as a “digital identity,” which refers to how someone learns from a media platform, and the attitudes and values they cultivate and propagate as a result (Gündüz 2017; Chung et al. 2021). Some adolescents may seek out specific communities, such as pro-eating disorder communities, in an attempt to ground their identity (Knapton 2013). Users have the option not to disclose their actual identity, allowing them to try out different personas and characters and engage with taboo topics without excessive self-exposure (Schmalz, Colistra, and Evans 2015; Yang, Holden, and Carter 2017). When cultivating a social media profile or persona, the user has many options for how they choose to present both their social and individual identities (Yang, Holden, and Carter 2017). Unsurprisingly, users often choose to show an excessively positive self-presentation that includes the best aspects of a person’s life, appearance, and accomplishments (Yang et al. 2018). This dynamic self-presentation is typical of younger adolescents due to their developmental phase, which is often characterized by an unstable sense of self that is heavily susceptible to peer influence (Yang, Holden, and Carter 2017).

Additionally, a common element in this developmental period is the experience of identity distress, referring to when a person experiences intense discomfort due to the subjective inability to harmonize various aspects of the self into a consistent identity (Yang et al. 2018). This problem is enhanced by social media, as youth now have more access to images of and information about the lives of others than ever before, providing them with endless choices of lifestyle, values, and community. When a person experiences sustained identity distress, they are at higher risk for experiencing more mental health issues with greater severity of symptoms, and prolonged low self-esteem (Yang et al. 2018).

When considering the potential influence of this kind of development, it is important to understand the ways in which adolescents cultivate identity, given that they are heavy users of social media. This age group often seeks emotional support from social media sites, either from published resources or from peers with whom they have formed a connection (Khasawneh et al. 2020). Someone living with a mental health condition, who is already more likely to seek support on the internet, is also particularly vulnerable to potential exploitation from other users or risk from viewing harmful content (Charland 2015). Adolescence in and of itself is a particularly vulnerable period in which people are more susceptible to peer pressure, identity distress, and the development of various mental health problems (Yang et al. 2018). At particular risk are adolescents who have a history of depression, childhood trauma, substance use, or PTSD. While creating social ties and community identities can act as a protective factor for this age group, the context of these ties may determine elements of risk that could also be present (Abrutyn and Mueller 2014).

Adolescents strive to create a collective identity, or a set of shared values, meanings, and behaviors that are often dynamic and shifting within the interactions among the individuals in the group. A collective identity is formed not only through solidarity and group support but also exclusion and “othering” practices (Whitehead 2010). Over social media, users have access to quick, immediate connections, which can make the world

seem smaller and more connected, serving as a way to strengthen social identity and connections rapidly (Schmalz, Colistra, and Evans 2015; Padín et al. 2021). Adolescents often use virtual communities cultivated on social media sites to disclose personal and vulnerable information to people that may be facing, or have faced, similar problems (Jarvi et al. 2013; Robinson et al. 2017). Users can help others, ask for help when needed, and receive direct communication replies from their formulated communities. This kind of interaction allows a person to experiment with alternative identities that they may want to take on and provides an escape from daily life where many taboo topics may be disapproved of or stigmatized (Gündüz 2017).

#### 4 Social Media and Comparison

Along with the potentially strong influence on adolescent identity development, the internet also offers many opportunities for various forms of social comparison (Smith 2017). Comparison happens in either an upward direction, when a person compares themselves with someone they view as superior to themselves, or a downward direction, when a person compares themselves with someone they view as inferior to themselves. Generally speaking, people tend to engage in more upward comparison behaviors, which can have negative psychological effects, especially when this kind of comparison is occurring regularly (Latif et al. 2021). Upward social comparison is also associated with a competition-based mindset, in which someone views the individual as a rival (Yang, Holden, and Carter 2017). Smith (2017) found that participants with more severe eating disorder symptomatology were more likely to make upward social comparisons to their friends, contributing to the continuance of disordered eating behaviors.

When engaging in social comparison, a person attempts to reveal information about themselves in relation to others and the world at large, doing so by comparing their appearance, accomplishments, and identities against another's. When exposed to largely embellished and enhanced content, a person, particularly an adolescent, may experience negative psychological outcomes, including, most saliently, negative self-view and self-esteem (Yang et al. 2018). This phenomenon is amplified by social media. For example, many sites such as Facebook and Instagram offer suggested friends, events, and access to tagged photos, which has the potential effect of expanding a person's social network and opportunities for comparison.

A study by Smith (2017) found that freshman undergraduate students were more likely to engage in comparison with distant peers on social media than with their immediate social networks or celebrities. Not only do these kinds of algorithms bolster these potentially negative comparison effects, but they can also lead to behavior performed to alleviate feelings of low self-worth or inferiority. Users' values and behaviors are influenced by the content they are exposed to on these platforms, especially content that allows space for positive regard and praise from a particular user or online community (Abraham et al. 2022; Westgate and Holliday 2018). In this way, algorithms and the way people are exposed to particular types of content play a large role in how users engage in social comparison, which has the trickle-down effect of changing what behaviors they might engage in to protect self-esteem.

## 5 Examples and Concerns Surrounding Social Media and Social Contagion

One of the most salient examples of the effect of social contagion over social media is the recent phenomenon of viral challenges that have arisen over the past decade. These challenges encourage users to engage in unconventional and, in some cases, risky behaviors (Abraham et al. 2022). The popular “ice bucket challenge” encouraged users to pour a bucket of ice water on themselves to benefit ALS fundraising, and accumulated over 17 million participants and almost 10 billion views over many different platforms (Abraham et al. 2022). While this challenge did not have any particularly dangerous potential outcomes, other viral challenges have encouraged participants in riskier ways. Particularly during the COVID-19 lockdown, teens that had more time to spend on social media began to engage in challenges with more frequency. Some of the popular challenges during this time turned dangerous, such as one that required users to climb rickety stacks of milk crates, another that involved chugging Benadryl, and another that encouraged high school-age youth to vandalize school property (Carville 2022). While these examples come with different levels of risk, other challenges have unfortunately turned lethal for adolescents who engage in them (Carville 2022). For example, the “blackout challenge” was linked to the deaths of 15 children under the age of 12, and five between the ages of 13 and 14 (Carville 2022). Another, the “blue whale challenge” that propagated escalating self-harm and suicidal behaviors, caught the attention of many national news outlets. In an analysis of how this challenge was covered by these outlets, it was found that a vast majority, 81%, violated the WHO guidelines surrounding suicide contagion (Roth et al. 2020). More specifically, many articles pointed to the blue whale challenge as the cause of death without substantial evidence and gave detailed accounts of the specific ways adolescents had attempted or died by suicide (Roth et al. 2020).

Motivations behind engaging in these kinds of behaviors range widely from person to person. One salient motivation was found to be attention seeking, especially in riskier challenges in which participants sought to compete with other users performing the challenge. In addition to the desire for recognition, some participants also cited curiosity and a need for entertainment as their primary reasons for participation (Abraham et al. 2022). When a person is exposed to specific behaviors repetitively, as one often is when challenges go viral, the effects of social contagion appear more saliently (Khasawneh et al. 2020).

Aside from viral social media challenges, the implications of social contagion via social media extend to other kinds of communities that expose their members to harmful content regularly. For example, a large self-harm community exists in online spaces that promotes non-suicidal self-injury (NSSI) and even offers tips and techniques on how to “better” engage in the behavior (Goldenberg et al. 2022). While these communities may have some benefits in providing potential support in recovery and a space for self-disclosure, they also come with a large amount of risk. This kind of content is often triggering to those with a history of NSSI, reinforcing cutting behaviors and providing a space for the normalization and celebration of self-harm. Additionally problematic are the ways in which these pages create a competitive atmosphere for users and participants, often encouraging community members to increase the frequency and severity of their behaviors (Goldenberg et al. 2022). On YouTube, users tend to positively rate videos that include NSSI content, such as graphic photographs or videos of a person actively harming themselves (Brown et al. 2018).

Outside of self-harm communities, suicide is often discussed and explored in online communities. In South Korea, internet suicide pacts are thought to account for as many

as one-third of all suicides, as using the internet has allowed people to seek out and find detailed information on methods of suicide (Carlyle et al. 2018). In 2023, suicide was the second leading cause of death among adolescents and young adults in the United States (Centers for Disease Control and Prevention 2023). Additionally, being exposed to suicide cluster-related content on social media platforms is associated with an increased chance of suicidal ideation or a suicide attempt shortly after viewing the content, especially for an adolescent that has preexisting vulnerabilities such as an existing mental health issue (Swedo et al. 2021). Even without confirmed exposure to explicit content, screen time as it relates to social media use has been correlated with increased depressive symptoms and suicidality (Roth et al. 2020).

While, again, there are some potential benefits to communication about suicide via social media, such as providing a sense of community and offering high-speed connection to those who may be in crisis, there are also many risks to consider (Robinson et al. 2018; Hilton 2018). The sharing of distressing images and content, explicit information about methods and locations of a suicide death, and causal implications regarding the reason for a person's suicide or attempt, all of which are common on social media platforms, explicitly go against the WHO safe reporting guidelines for suicide and may increase risk (Robinson et al. 2018; Roth et al. 2020; WHO & IASP 2017).

When considering these effects and the observation of the connection between mental illnesses and social media usage, some have labeled the rising phenomenon of these sites' effects on mental health as a public health epidemic (Padín et al. 2021). Online spaces that promote potentially risky behaviors run the risk of having counter-therapeutic effects on their audience, especially when the audience is primarily composed of adolescents (Yang et al. 2018; Charland 2015). Even if a user is simply seeking out more information about mental health or potential resources, social media offers immediate access to unregulated content that may expose them to biased, false, or fear-mongering information. This varied, overabundance of information about mental health behaviors and conditions waters down helpful and protective information, and instead often reinforces preexisting behaviors or encourages new ones, as seen in the example of NSSI communities (Charland 2015; Goldenberg et al. 2022). Adolescents are especially susceptible to this kind of behavioral contagion due to their developmental stage and separation from adults in favor of peer communities that institute strong in-group loyalty (Brady 2014; Goldenberg et al. 2022; Chung et al. 2021). This kind of loyalty has the potential to be especially problematic in the context of communities centered around harmful and risky behaviors, such as pro-ED platforms.

## 6 Etiology of Eating Disorders

Eating disorders are a complex set of mental illnesses whose origins often lie at the cross-section between psychological factors and sociocultural influences (Smith 2017). There are several different diagnoses under the umbrella of eating disorders, all of which may present very differently. One of the most commonly referenced disorders is anorexia nervosa, which is associated with weight loss, food restriction, and distorted body image. While restrictive-type disorders often come to the forefront of the cultural imagination when thinking about what an eating disorder is, there are others, such as bulimia nervosa, which is associated with binge and purge cycles; binge eating disorder, characterized by episodes of bingeing followed by emotional distress; or avoidant restrictive food intake disorder, which is a largely fear-based disorder in which a person consumes a very low variety of food to the point of malnourishment (NEDA 2023). Even outside of these, there are many variations in the presentation and effects that an eating disorder has on an individual.

While all eating disorder diagnoses are significant and dangerous, restrictive-type disorders such as anorexia and, on occasion, bulimia are most reinforced by culture and media. In Western culture, there is a high value placed on thinness, and media narratives often perpetuate the narrative that if someone achieves thinness, life will improve (Smith 2017; Allison, Warin, and Bastiampillai 2014). This narrative is seen across fictional movies, TV shows, magazines, books, and even personally curated content now on social media. These portrayals expose people, particularly young people, to the thin ideal, and embed the pressure to achieve this at a very young age (Smith 2017). As stated previously, many factors contribute to the development of an eating disorder, including psychological and genetic elements, but the sociocultural influence has proven to be a strong precursor as well. In particular, body dissatisfaction, as perpetuated by modern media, is a consistent predictor of engagement in eating disorder behaviors and disorder development (Padín et al. 2021).

## 7 Social Factors in Eating Disorders

There is a strong social component in both the development and the perpetuation of eating disorder behaviors that occurs on a cultural as well as peer-to-peer level. Specifically, adolescent peer groups are known to have a salient impact on individual health behaviors, in particular, behaviors surrounding diet (Chung et al. 2021). Particularly in female adolescent friend groups, heavy emphasis on body image and weight loss has been observed, leading professionals to believe that peer groups may contribute to the high prevalence of disordered eating among this demographic (Allison, Warin, and Bastiampillai 2014; Chung et al. 2021). When unhealthy behaviors are not only tolerated but encouraged in these groups, behaviors can become more intense or competitive (Allison, Warin, and Bastiampillai 2014). One study found that when adolescents had friends who displayed symptoms of bulimia nervosa, they were more likely to endorse or support bulimic symptoms themselves (Smith 2017).

As previously described, social comparison is an important tool that adolescents use to orient themselves in the world around them and to explore personal values and desires (Smith 2017). It is an important aspect of the social elements of eating disorder behaviors. A common form of this is appearance comparison, in which an adolescent compares their body to the bodies of others (Smith 2017). Because there is a high ideal placed on thinness, many of the portrayals of bodies in the media, and social media, are of thin bodies, creating a very specific standard to which many adolescents compare themselves (Smith 2017; Allison, Warin, and Bastiampillai 2014). People that engage in appearance-based social comparison unsurprisingly display higher levels of body dissatisfaction than those who do not engage in this kind of comparison (Smith 2017).

More recently, it has been observed that adolescents with anorexia often actively seek out relationships with other anorexic peers to support and encourage one another to engage in eating disorder behaviors (Allison, Warin, and Bastiampillai 2014). These kinds of relationships are referred to as counter-therapeutic, meaning that they have detrimental and harmful effects on those who engage (Allison, Warin, and Bastiampillai 2014). This kind of social imitation and, in many cases, competition, has a powerful influence over the behaviors of groups of adolescents. When a group revolves around eating disorder characteristics such as weight loss, dieting, extreme exercise, or purging, the voice of the eating disorder becomes the authority and driving force underpinning group dynamics (Allison, Warin, and Bastiampillai 2014).



## 8 Eating Disorders, Contagion, and Social Media: The Pro-ED Landscape

With the growth in popularity and accessibility of social media platforms, pro-eating disorder online communities have formed, often painting disordered behaviors as a desirable lifestyle choice (Brady 2014; Whitehead 2010; Knapton 2013; Hilton 2018). Sharpe et al. (2011) found that in a sample of adolescents, 12.6% of girls and 5.9% of boys had visited a pro-ED website at least one time. Visitors to these online spaces support one another in restriction, purging, and other weight loss efforts, and post inspirational images or texts promoting extreme thinness. Many of these posts are tagged as “thinspo,” short for “thinspiration,” that feature thin, often sickly bodies, which are presented as a goal or desire for viewers to strive for. On the social media platform Tumblr, the “thinspo” hashtag once garnered 15 billion views and 120 million unique users per month (Brady 2014). In these communities, restriction is often painted as a skill that can be improved upon over time, and should be practiced. Not only does this cultivate competition within the group, but it often pushes group members to further and further extremes (Knapton 2013; Rajan 2018). Overall, pro-ED pages tend to have shared characteristics across platforms. These include weight loss tips, how to keep the behaviors a secret, purging tips, images or text posts that promote extreme thinness, and creative writing that glorifies eating disorder behaviors (Sharpe et al. 2011).

Another feature of these communities is the personification of the eating disorder, often viewed with both fear and idolatry (Knapton 2013). “Ana” and “Mia,” indicating anorexia and bulimia, are lauded as positive guiding forces or, sometimes, as evil oppressive figures. Whether a person views the eating disorder in a positive or negative light, the effect of encouragement and perpetuation of disordered behaviors is similar (Knapton 2013). On pro-ED sites and pages, not every user is an active one. Passive social media users, also known as visitors versus residents who consistently engage, are individuals who do not generate direct interpersonal connections with other users and typically do not generate their own content regularly. Even with this passive interaction, individuals still often engage in social comparison and, in combination with potential isolation, they still risk negative psychological effects (Padín et al. 2021; Hilton 2018).

Regular exposure to edited images portraying “ideal,” often thin, bodies, has been used to predict levels of eating disorder symptomology and dissatisfaction with body image among adolescent girls (Rajan 2018; Hilton 2018). The user utilizes the content posted by other creators as a reference point for self-evaluation, which is particularly dangerous given the extremes that are often posted to pro-ED sites (Latif et al. 2021). Pro-ED users tend to be young females, often who already suffer from an eating disorder. Hilton (2018) found that approximately one-third of patients with eating disorders reported viewing pro-ED content regularly. Those who already suffer some level of body dissatisfaction are less likely to ignore messages about the thin ideal perpetuated by pro-ED content (Smith 2017).

Content that is created and shared by other adolescents is comparably influential to commercial marketing, making the images and posts in these communities particularly dangerous (Chung et al. 2021). A person is more likely to be susceptible to this kind of messaging if they use interactive features of social media such as commenting, posting, and having lots of friends; spend excessive amounts of time on social media; have poor self-esteem; and are female. While female-identifying individuals tend to engage in more social comparisons over the internet, men’s body satisfaction and eating patterns are also influenced by social media (Padín et al. 2021). Additionally, content on social media platforms often touts the eating disorder as a glamorized, ideal way of life, which can create ambivalence toward seeking treatment among group members (Knapton

2013).

## 9 Identity-Building in the Pro-ED Virtual Space

Patients with eating disorders often experience severe identity issues, and often the label of “anorexic” becomes an extremely important part of the self (Charland 2015). Much of the content posted and spread on pro-ED websites is posted with the intention of reinforcing and romanticizing aspects of the illness, which can discourage people from recovery and treatment (Charland 2015).

The use of social media also contributes to the internalization of societal norms about thinness and beauty and the development of negative body image. These factors not only have the ability to affect adolescents’ eating behaviors, but they also contribute to the development of identity (Padín et al. 2021). Envy of other users can bolster resentment and low self-esteem, and a desire to have the perceived advantage that the other person has (Latif et al. 2021). This process creates a frame of reference for values and the assignment of superiority and inferiority, creating a virtual landscape in which extreme pro-ED content is posted, often viewed by vulnerable adolescents who are struggling to find a sense of self, and who may latch on to the idealized portrayal of eating disorder behaviors as an identity-building block (Charland 2015; Padín et al. 2021).

While there are significant risk factors in engaging in pro-ED content, millions of people continue to use these sites regularly, causing many to wonder why (Brady 2014). One reason may be the support that users can seek out in these communities from peers who have gone through, or are going through, a similar experience (Hilton 2018). When struggling, it is common for individuals to reach out to others to negate and better cope with negative emotions, and individuals struggling with body dissatisfaction, eating disorders, or identity instability are no exception (Chancellor, Lin, and De Choudhury 2016; Smith 2017). Pro-ED online communities may serve as a space in which users can explore different identities and traditionally taboo subjects that may not be welcomed in mainstream conversation, with the option of anonymity (Brady 2014; Pavalanathan and De Choudhury 2015). Additionally, users can build collective identities which, regardless of whether the behavioral outcome is ultimately harmful, can foster positive emotions stemming from feelings of safety, control, and achievement, and sometimes a sense of superiority when opportunities for downward comparison arise (Whitehead 2010; Knapton 2013; Sharpe et al. 2011).

## 10 Guidelines for Posting: Complications and Concerns

To build upon the WHO guidelines for safe suicide reporting, some mental and public health professionals have called for similar guidelines for social media posting to mitigate harm spread by social contagion (WHO & IASP 2017; Roth et al. 2020). Brownlie et al. (2021) suggests focusing more broadly on preventative efforts when formulating guidelines that educate users on the larger implications of the content that they post regarding not only suicide but other sensitive topics as well. Current suggestions call for the creation of informative guidelines surrounding what kind of eating disorder content is harmful, potential alternatives to engaging with pro-ED content, and harm reduction strategies (Sharpe et al. 2011). These guidelines should be accessible to anyone, including parents, healthcare providers, social media producers, and users themselves. Given the prevalence of adolescent activity on social media, we support the suggestion to involve adolescents in the creation and dissemination of these guidelines in order to effectively appeal to the vulnerable demographic (Roth et al. 2020).

There are several complications social media presents that differ from traditional media sources. For example, on social networks there is an immediacy of information spreading, and posts have the ability to go viral almost immediately or become suggested content to those outside of someone's immediate social circle (Brownlie et al. 2021). Social media platforms have become one of the primary ways in which content is disseminated and consumed, placing more emphasis and urgency on the need for guidelines or regulations for particularly high-risk behaviors such as self-harm and disordered eating (Sumner, Burke, and Kooti 2020). Given that different types of content exposure seem to affect individual users differently depending on unique characteristics and context, more empirical research and active collaboration is needed from the mental health community in order to validate interventions and guidelines that can be successfully protective and not produce unintended increases in exposure to potentially harmful content.

While there does seem to be a clear call to action regarding this issue, there is little agreement on how exactly to address it productively. A set of guidelines surrounding how to post about suicide, called #chatsafe, has been developed by an organization called Orygen, in consultation with youth and international experts, which detail various "shoulds" and "should nots" of discussing suicide online. Some of these guidelines are reflective of the WHO guidelines, while others are more specifically targeted toward content creators (WHO & IASP 2017). It includes tips for self-care after viewing suicide-related content, how to communicate about personal experiences with suicide, and communicating with a person who may be affected by suicidal ideation (Orygen 2023; Robinson et al. 2018). The #chatsafe guidelines are meant to have applicability to the more dynamic nature of social media than traditional media sources have. While this is a helpful starting point to assist people who may be interested in posting safely, these guidelines are strictly voluntary, and without wide publication of potential dangers, much of the general public is largely unaware of the issue (Sumner, Burke, and Kooti 2020).

In some countries, legislation establishing posting guidelines has been suggested as a solution to social contagion. However, many have expressed concern that these kinds of laws edge too close to interfering with free speech and autonomy (Ng, Panirselvam, and Chan 2021). Social media platforms themselves strive to moderate problematic content posted to their sites. Many websites have attempted to ban certain tags on posts that indicate they include graphic or potentially harmful content. As a result, participants in these online communities have evolved specific coded language to indicate eating disorder content and evade this kind of detection, an evolution that happens too fast for an algorithm to catch up to (Goldenberg et al. 2022; Brownlie et al. 2021). There is an additional concern that if these social media communities are seen as being persecuted, community members, especially young community members, may gain a sense of closer-knit solidarity against perceived authority oppression, pushing them deeper into potentially harmful group dynamics (Brady 2014). If these communities cannot take place on mainstream social media, it has been proposed that they may become more reclusive and difficult to find, making them even more challenging to monitor (Goldenberg et al. 2022).

## 11 Potential Mitigation Strategies

There is debate surrounding how to address the growing phenomena of pro-eating disorder communities and the potential for behavior contagion. On the one hand, they provide needed support to people who may feel misunderstood or alienated by treatment or recovery communities. On the other, they both initiate and maintain body dissatisfaction and disordered eating behaviors in users, often adolescent girls (Hilton

2018; LaMarre and Rice 2017). Addressing the issue without further alienating members of this community becomes a very nuanced task. Some have suggested that more recovery content should be funneled toward users that have a history of browsing pro-ED content. In engaging in the recovery community, members would still have the opportunity to voice their experiences to people who have an intimate understanding of the struggle, but who may be more likely to steer the individual toward help (LaMarre and Rice 2017). However, this solution is imperfect given that representations of recovery may also drive negative self-comparison, and despite the theme of the content, many people have been shown to find eating disorders and weight loss tips on recovery sites (Sharpe et al. 2011; LaMarre and Rice 2017).

Instead of relying on the users themselves to modify posting, some believe that the social media platforms should impose restrictions and bans on certain kinds of content. From a technical perspective, platforms could remove harmful content, use content warnings for tagged posts, or provide options to filter out certain kinds of material (Sharpe et al. 2011). While some websites such as Tumblr already implement content warnings, they have been proven largely ineffective in preventing users from viewing posts and sometimes even increase site visits (Sharpe et al. 2011). Some have experimented with offering real-time mental health support when a user is flagged for viewing pro-ED content, though the effectiveness of this is currently unknown (Pavalanathan and De Choudhury 2015).

Another, more accessible option includes preventative measures to create protective factors against social contagion. Raising awareness, for parents and healthcare workers especially, about pro-ED communities and content and the potentially harmful effects is essential, as many people are unaware of the issue (Sharpe et al. 2011; Padín et al. 2021). This awareness becomes relevant to treatment, because the salient identity ties that many form in pro-ED communities are important to replace in healthcare settings (Sharpe et al. 2011). Providing knowledge and insight to the complex nature of this issue, not only including the existence of these sites, but also offering potential explanations for adolescent motivations for engaging with this content, is critical insight for caregivers in order to best understand and address the risks associated with pro-ED social media pages. Because this is a serious public health issue, the healthcare community and its professional associations need to play a more prominent role in raising awareness for patients and the public, while at the same time advocating for stricter adherence to a more expansive set of recommended guidelines.

While advocates, parents, and healthcare professionals play an important part in ensuring the safety of adolescents online, when adolescents themselves produce informative content, other adolescents are more likely to engage (Robinson et al. 2017). Creating opportunities for those who have been directly exposed to pro-ED social media pages to help develop messaging and policy surrounding best practices to inform their peers of potential risks and harms is an important component in creating relevant messaging for those who have been or are at risk of exposure to these communities. A promising method of communication surrounding this nuanced issue is to utilize the immense power of social media to disseminate information on pro-ED alternatives and harm-reduction techniques that have been created with the aid of young people themselves to appeal to users directly (Westgate and Holliday 2018).

With an understanding of some of the reasons that adolescents may seek out engagement with pro-ED platforms, interventions can be better tailored to offer other options for identity-building, community, and support that may be more recovery-oriented or, at the very least, less harmful than the unmoderated content that most users currently interact with. The interactions between social contagion, social media, and pro-eating disorder communities are dynamic and complex, and they must be approached delicately in order

to avoid perpetuating more potential harm. Involving youth in creating messaging to educate not only parents and healthcare workers, but also their peers who may be at risk of exposure to social contagion via pro-ED communities on social media is a promising method for disseminating valuable and relevant information in a sensitive and informative way.

## 12 A Path Forward

The proliferation of content that poses risks for contagion and harm is one of the most significant challenges facing social media platforms, and one for which more research and attention is warranted. We propose the following multistep approach to progress industry-wide standards that will minimize potential harms:

1. Recognize, acknowledge, and educate that media in all of its various forms influences public health by amplifying messages both good and bad, and that impacts are variable. Establish an ethical expectation across the industry and user base to collectively contribute to the good and minimize harm.
2. Develop and normalize a code of conduct for social media producers, as exists for journalists, physicians, and other professionals. For example, one of the four foundational principles of the Society of Professional Journalists' Code of Ethics is to "minimize harm," which includes the mandate to "balance the public's need for information against potential harm or discomfort" (SPJ 2014).
3. Pursue and fund sorely needed empirical research to more fully understand what are helpful and harmful uses of social media, particularly for those with unique vulnerabilities such as experiencing or recovering from disordered eating, self-harming behaviors, and suicidal ideation.
4. Offer greater control to those engaging with social media to manage and curate the content, messaging, and ads they encounter through preference selections, chronological feeds, mute buttons, and other potential new design innovations that could support healthier, tailored experiences.
5. Develop a comprehensive set of interdisciplinary guidelines (and subsequent training) for social media platforms and creators around how to handle content with high potential to promote harm to oneself and others (such as eating disorders, suicide, self-harm, online challenges, and violence).

To pursue this last recommendation, building on successful precedents such as the development of #chatsafe 2.0 (an evidence-based set of global guidelines for supporting online communication around self-harm and suicide), a multipronged, collaborative, youth-informed, evidence-based approach would facilitate a foundational set of expanded best practice guidelines from which to build (Robinson et al. 2023). Involving the healthcare community (mental health providers, public health professionals, primary care, etc.) will be important in order to expand awareness, expertise, and impact. A first step would be to extrapolate recommendations from those that already exist for news media, and those that do address social media specifically, and begin an initial draft of best practice guidelines that cut across topic areas, but consider the social media context. A basic list that could apply to multiple high-risk behaviors might include recommendations such as: minimize sensational language, avoid graphic imagery, remove and/or heavily moderate comments on posts related to suicide/self-harm/eating disorders, verify veracity of posts before sharing, and always include accompanying resources for crisis services. A next step would be to engage a group of global, multidisciplinary experts to collaboratively review and contribute to iterations of the new set of guidelines, followed

by a thoughtful process of engagement with diverse communities of youth impacted by the harms we are trying to mitigate, in order to develop harm reduction strategies and language that would be both appropriate and tolerated.

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