



Limerence, Hidden Obsession, Fixation, and Rumination: A Scoping Review of Human Behaviour

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Abstract

This systematic scoping review explores the behavioural state of limerence and the relationship it has with rumination as part of a precursory phase to stalking, for the purpose of identifying a trajectory in harmful human behaviour. The review also considers how limerence impacts those who experience it, as well as factors which serve as accelerants to this cognitive state. It examines cognitive disorders identifiable on the DSM-5, such as obsessive–compulsive disorders, autism spectrum disorders, and erotomania, and applies them to studies which conceptualise limerence as an obsessive behaviour. At present, there is extraordinarily limited literature focusing on this state of unrequited and intense human emotion towards another person—a phenomenon characterised by limited by self-awareness and restraint, yet also a state that involves obsession and fixation, sharing cognitive characteristics and behaviours intrinsically tied to stalking behaviours. This review argues that behaviours exhibited in a state of limerence can serve as the building blocks upon which more harmful, externally focused stalking behaviours could develop. This review identified that the emerging literature on limerence offers new and important insights into the psychology of obsessive desire as a precursor to other, more proximal forms of violence which warrant greater attention, as they do not fit into existing psychological classifications of obsession because these behaviours are motivated by a lack of reciprocation and rejection. The objective is not to label individuals experiencing limerence as deviant but, rather, to better understand how fixation and obsessive desire can be maintained in the absence of approach behaviours.

Keywords Limerence · Stalking · Obsession · Fixation · Interpersonal violence · Pathways into offending

Introduction

The study of limerence is still in its infancy but there has been a rapidly increasing amount of scholarly attention brought to the topic since the concept of limerence was introduced by psychologist Dorothy Tennov in 1979. Having conducted more than 300 qualitative interviews on the topic of ‘being in love’, Tennov identified a unique phenomenon she called *limerence*. Limerence was defined as a cognitive state which involved involuntary, obsessive, fixated, and unrequited love for another person that was all consuming and intrusive. Since Tennov’s (1979) initial work on limerence, the subject has received limited scholarly attention,

whether that involves its application to harmful sexual behaviours and interpersonal violence against others or the destabilising nature of the condition on those experiencing limerence, which can result in devastating impacts on their lives and overall mental wellbeing (Banker 2010). Conversely, the literature also fails to examine how those experiencing limerence are able to moderate their behaviours, avoiding becoming destabilised through self-regulation of their own fixated and obsessive thoughts.

To address this shortfall, this rapid scoping review will examine the theory of limerence, the impact it has on the person, and factors that may serve either as enablers or inhibitors to acts which take obsessive behaviours beyond the phase of rumination (Kim and Jeon 2020). It considers factors which serve as enablers or even accelerants to limerence, such as widespread access to digital devices and social media (Ursyn 2018), in addition to elements related to self-regulation (Willmott and Bentley 2015) and attachment (Wolf 2017). The article contends that there are strong correlations between limerence and early-onset

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pathways into stalking (Willmott and Bentley 2015). We argue that similar obsessive, fixated, unrequited, and uncertain facets present in stalking behaviours are also reflected in the characteristics of limerence (Coleman 1991; Willmott and Bentley 2015). The key difference between the two behaviours is that, in the case of limerence, these traits have not yet developed into series of actions that cause fear in the focus of a person's obsession, or the limerent object. By considering these two related concepts in conjunction, there is an opportunity to build knowledge that can be used in practice, adding to the understanding of obsessive and fixated behaviours among those practitioners who may be faced with individuals seeking help for their intrusive, obsessive thoughts—whether they have already escalated to the level of stalking or not.

To do this, this paper will examine existing literature that focuses on defining the phenomenon of limerence, before progressing on to discuss other factors often attributable to delusional and obsessive behaviours that are associated with romantic desire, such as erotomania and ADHD. This will be followed by an examination of the relationship limerence has with attachment disorders to determine whether they are synonymous, before embarking on a final exploration of the factors which serve as both accelerants and inhibitors linked to encouraging or restraining behaviours from going beyond a phase of rumination to a more proactive state, such as the internet. The purpose of this article is to systematically examine if there are correlations between clinically acknowledged neurological disorders that are intrinsic to obsession and the characteristics of limerence.

To do this, a rapid scoping review was carried out to identify literature that captured not only limerence but also additional contributing factors that could explain its origin, trajectory, and characteristics from both a clinical and social-psychological perspective. An approach that has been frequently conducted by social scientists when examining topics such as obsessive behaviours and limerence (Grant et al. 2022; Evans 2023), the purpose of using this methodology was to 'determine the scope or coverage of a body of literature on a given topic and give clear indication of the volume of literature and studies available as well as an overview (broad or detailed) of its focus' (Munn et al. 2018, p. 2.).

From this research, using Google Scholar, it was ascertained that there have been 879 publications that have mentioned the word 'limerence' in the last ten years. When this was combined with other key words, using a Boolean search formula (Bramer et al. 2018; Aromataris and Riitano 2014), there were significantly less publications available. To determine the key words used, several overarching research questions were used as guidance, which included the following:

1. In what ways is limerence attributable to clinical disorders recognised by the DSM-5 (Diagnostic and Statistical Manual of Mental Health)?
2. What factors lead to the development and dissolution of limerence?
3. In what ways could limerence be viewed as being intrinsic to the development of harmful obsessive behaviours such as stalking?

To explore the literature available for research question 1, the following Boolean formulas were used (with the number of publications returned in brackets): 'LIMERENCE' AND 'ADHD' (34), OR 'OCD' (44), OR 'EROTOMANIA' (16) OR 'SELF REGULATION' (87). To identify available literature for question 2, the following search formula was used: 'LIMERENCE' AND 'TRAJECTORY' (126) OR 'PHASES' (145) OR 'DISSOLUTION' (134) OR 'ADVERSE CHILDHOOD EXPERIENCES' (11). For question 3, the following terms were included in the Boolean formula: 'LIMERENCE' AND 'STALKING' (65) OR 'OBSESSION' (201) OR 'HARASSMENT' (77).

Following this process, the literature was narrowed again to only include peer-reviewed studies which dramatically reduced the material returned for each formula combination, resulting in a final sample of 43 publications. The most common search return was 'TRAJECTORY' (10) and 'DISSOLUTION' (7), with the least common being 'ADHD' (0) and 'ADVERSE CHILDHOOD EXPERIENCES' (ACES) (1). This indicates that the relationship between ADHD and ACES with limerence is either an area that has simply not been explored by researchers at this point in time or that the connections are not viewed as being worthy of exploration. The lack of literature on the topic of limerence overall validates the need for further discussion on this reported phenomenon and what such intense feelings of unreciprocated fixation and obsession could amount to.

Defining Limerence

Limerence is defined as the obsessive attachment to a person in which there is an overwhelming longing for another person's attention, who is referred to as the 'Limerent Object' (LO) (Tennov 1979). This cognitive state is characterised as being distinct from feelings associated with having a 'crush' or being 'in love' as, unlike in a crush, the feelings of intense longing come and go. In limerence, intense feelings can persist for years, become addictive, and develop into obsessive rumination that is motivated by both doubt and hope (McCracken 2024). These feelings are completely involuntary and all-consuming, to the extent that those who experience limerence have intrusive thoughts of the person of whom they are fixated upon (Willmott and Bentley 2015).

Unlike conventional romantic relationships based on mutual affection, the state of limerence is typically based upon unrequited love (Verhulst 1984). The degree of uncertainty about the LO's reciprocation of affection has been identified a driving force behind the escalation of limerence and the motivation of associated behaviours (Wyant 2021). The greater the level of uncertainty as to whether a LO reciprocates the afflicted person's affection, the greater the impact of limerence (Wolf 2017), and the greater degree of rumination that takes place (Wyant 2021) and the increased desire for said reciprocation.

In the absence of securing reciprocation from the LO, the limerent individual (LI) can become completely consumed by their obsession and develop an imagined reciprocation as a means of sustaining their emotional needs (Willmott and Bentley 2015). The effects of limerence can be devastating to those experiencing it and include, but are not limited to, symptoms of post-traumatic stress disorder, depression, attachment anxiety, self-harm, stalking, and the breakdown of existing relationships (Willmott and Bentley 2015). Since the work of Tennov, there have been several studies that have explored the differences between men and women in their sexual fantasies (Ellis and Symons 1990; De Munck 1998; Peplau et al. 1998). Such research has found that whilst both men and women both experience lust and limerence, it is men that more commonly experience lust, and women more commonly experience limerence (Peplau et al. 1998). However, what is less clear is how limerence develops and the contributing factors that perpetuate or contribute towards the feelings being sustained or dissolved.

Trajectory of Limerence

There have been significant differences in how the transitional stages involved in the trajectory of limerence are categorised, with some researchers proposing there are only three stages and others suggesting as many as seven. One of the most popular conceptualisations comes from Verhulst (1984) who concluded, after reading Tennov's work, that there were five stages of limerence:

1. **Pre-limerence:** In this stage individuals are actively longing for love, but have not fixed their attention on a specific individual to assign them as the LO. It is a state of readiness in which there may be some level of attraction to one or more persons. Any indication of reciprocation ultimately determines who the LO is. The desire to be intensely loved is what fuels the limerence, not any rational or realistic reason for relationship development.
2. **Pre-reciprocity:** This stage relates to the significant and rapid development of interest by the LI towards the LO. There is not always an immediate sexual attraction,

though there is the desire to be sexually active. Non-verbal indications of attraction are directed towards the LO, and if these are rebuffed, this results in high levels of despair which will gradually dissipate and be replaced with a renewed state of limerence. If the LO does not make any clear rejection of the actions made by the LI, then this is interpreted by the LI as mutual reciprocation.

3. **Reciprocity:** When the LO reciprocates with feelings of love and/or interest, this results in a period of intense obsession that may last for mere days or years. As there must be a combination of both hope and uncertainty for limerence to be sustained, this often reduces the length of reciprocity as mutual limerence increases uncertainty and decreases the extent of the limerence investment.
4. **Gradual dissolution:** As the intensity of limerence wanes or dissolves entirely, there can be an increase of anxiety to replace it. This can result in a variety of responses, from blame to increased feelings of being deceived. It is also possible for individuals to cling to the idea of limerence and attempt to re-establish those feelings when those original acts of limerence have dissolved. This may, in turn, induce feelings of despair and distress in the LI. However, if neither partner is made accountable for the dissolution of limerence, then it is possible for a healthy relationship to be developed.
5. **Post-limerence:** This is a stage when no trace of limerence exists within a relationship and strong, healthy, communicative attachments can then be formed. After a stage of gradual dissolution, it is a rarity that this stage is achieved due to the highly emotive and conflict-driven state involved in limerence, which in individuals deliberately returning to a pre-limerence state and actively searching for a new LO.

Verhulst viewed the intensity of a person's limerence as being varied, depending on a myriad of circumstances during the development of the infatuation, including but not limited to the perceived level of reciprocity. It is important to note that high, intense levels of limerence can include conflicting emotions ranging from intense joy and ecstasy to complete despair, which oscillates in response to experiences, and interpretations of rejection or reciprocation (Tennov 1998; Banker 2010).

Limerence Versus Erotomania

Initial correlations could be drawn between the state of limerence and erotomania, sometimes called 'de Clérambault's syndrome' (Brune 2001). Despite some superficial similarities, however, there are distinct differences between the two conditions that must be considered in delineating limerence as a distinct cognitive state that requires attention

in its own right. Firstly, erotomania is defined as being a delusional belief in that someone is in love with oneself, with that person, more commonly than not, in a position of greater power and social status (Valadas and Bravo 2020). In contrast, limerence is not status or power specific, and the LO can thus be any person the LI becomes fixated and/or obsessed with. The individual suffering from erotomania, which clinical studies suggest is generally a woman (Bleakley and Cupano 2023), is usually genuine in their belief that the object of their attention is in love with them (the subject) and, in fact, it is possible for the subject to have no romantic or sexual feelings towards the object themselves. Erotomania is about the delusion of *being* loved, pursued, and obsessed over by another (Jordan and Howe 1980). Limerence, on the other side coin, is defined as unrequited love experienced by the LI, with a lack of knowledge or belief in reciprocation what distinguishes it from erotomania in practical terms. The LO is typically (at least at first) completely unaware of the infatuation, yet the LI holds on to their desire in the hope that their love will at some point be reciprocated, reversing the relationship between subject and object observed in cases of erotomania.

Erotomania is recognised within psychiatry as a rare delusional disorder that is connected, primarily but not always, to individuals with a history of psychosis (Jordan et al. 2006). Whereas there is no formal clinical diagnostic for limerence, parallels have been drawn with better known, and more established, clinical disorders related to obsession (Wakin and Vo 2008). As the romantic obsessions formed in states of limerence intensify, they have the potential to develop to a point of dissociation from reality, as the LI's intrusive thoughts begin to monopolise their daily lives (Sutherland 2022). Ritualistic behaviours can become embedded with behaviours that echo the diagnostic traits of obsessive-compulsive disorder (OCD) (Wyant 2021). There is, however, an important primary difference between limerence and OCD behaviours. The aetiology of OCD, such as with mysophobes or hoarders, is that they include *all* germs or *all* belongings whereas, with limerence, the focus is upon one thing, a person (Sutherland 2022).

Limerence and Attention-Deficit/Hyperactivity Disorder (ADHD)

As noted, there have been some parallels drawn between cognitive impairments and neurodivergent behaviours like OCD to explain the cognitive state of limerence. An alternative prism through which to understand limerence, however, is provided by a diagnosis that is much more common: attention-deficit/hyperactivity disorder, or ADHD. This is a neurological condition that is estimated to affect 506 million adults around the world (Song et al. 2021). It effects a person's ability to focus

and complete tasks, but it also impacts on their executive function, an area of the brain that is responsible for decision-making, risk, and empathy (Beaudoin et al. 2017). This part of the brain is also responsible for reward-seeking behaviours and regulating behavioural impulses which, for individuals with ADHD, are often driven by the search for constant stimulation due to a lack of dopamine production (Wender et al. 2001). This can have many beneficial effects, such as the amplification of a person's degree of creativity and their ability to focus on a specific task, even to the extent of hyperfixation (Hupfeld et al. 2019). This sense of intensification is also applied to sexual and romantic interests (Pera 2016). The individual with ADHD can experience a rapid onset of intense feeling towards another, 'love-bombing' them with attention one minute, then losing complete interest and redirecting their attention in a split second to another focal object (Ozel-Kizil et al. 2016).

In comparing ADHD-fixated romantic attachments to limerence, it is possible to again draw parallels based on these traits alone. The intense, hyperfocused degree of fixation towards another person without the requirement for reciprocity is, in particular, an area of notable overlap between the relational behaviours experienced by those with ADHD and the LI. Unfortunately, there is little to no discussion around the topic of ADHD and desire in the literature at this point in time, constituting a major gap in the study of fixation and obsessional relationships. Additionally, there is also limited focus on sexual desire and the autism spectrum, despite similar attributes in evidence and scope for better understanding of neurodivergence in interpersonal relationships. There is, however, an abundance of literature exploring the relationship between autism spectrum disorders (ASD), delusional behaviours, and stalking (Stokes et al. 2007; Post et al. 2014; Mercer and Allely 2020; Sperry et al. 2021). This indicates, once again, that more research around first stages of attraction-based fixation is needed to develop a more comprehensive literature base on the precursors to stalking behaviours, especially about the relationship between stalking acts and understudied cognitive states like limerence. To limit the research to connections between cognition and stalking without first considering the behavioural processes which may lead to a course of conduct amounting to stalking is tantamount to addressing the problem on a superficial basis, without first exploring the root causes which may be identified and addressed through early intervention, preventing behaviours from escalating to a harmful level.

Convergence and Divergence Between Limerence and Stalking

As alluded to, there is significant convergence between limerence and stalking, with the former potentially providing insight into factors motivating the behaviours characterised as the latter. Limerence is often characterised as an extreme

expression of normal human emotion whereas stalking is presented as a darker, criminal side of relationships tied to a progression into harmful (typically, criminal) behaviours. Stalking encompasses a variety of persistent behaviours that are unwanted and intrude on the life of another to a degree that causes them emotional distress and fear (Mullen et al. 2009; Reyns and Engelbrecht 2013). Stalking is generally considered to be triggered by a range of factors including (but is not limited to) the end of an important relationship, the potential of a sexual relationship, or feelings of mistreatment and supported by the motivations of reconciliation/control, intimacy, or revenge (Mullen et al. 2009). The key tenants of stalking include persistence and repeated actions which continue despite a victim's active efforts to disengage. This is maintained by a fixation that is unmovable and likely to be supported by the underlying belief that the stalker's actions are justified (Mullen et al. 2006). The pattern of behaviours is likely to escalate—in some cases into violence—and, as such, stalkers pose a risk of psychological and potentially physical harm to those targeted. In addition, there is usually significant disruption to the life, relationships, and social functioning that occurs as a product of stalking, creating collateral consequences for victims that extend beyond the specific acts of a stalker themselves (Westrup et al. 1999; Short et al. 2015).

There are several facets of limerence that are closely correlated to the basic tenets of stalking and may even constitute important precursor behaviours. Specifically, an obsessive fixation with an object of interest (victim) and a destabilisation of the self in order to pursue that interest are common to both the stalker and the LI, albeit manifesting in distinct ways (Willmott and Bentley 2015). The stalking classification model developed by Mullen (2009) identified the 'intimacy seeker' type which aligns closely with the conditions experienced by the LI. The 'intimacy seeker' operates within a context of loneliness (or, at least, lack of love) and is motivated by the aim of establishing an intimate relationship, sustained by the fantasied, idealised relationship and which substitutes for real relationships with others. It is also the only type of stalking in this categorization system in which women outnumber men (Mullen et al. 2009).

The similarities between limerence and intimacy-seeking stalking lie in the idealised nature of the object, fixation, and the constant monitoring and rumination associated with it (Tennov 1979; Johnson and Thompson 2016). There are, however, clear differences between intimacy-seeking stalking and limerence which are mostly centred on approach behaviours, and the realistic identification of rejection in the event an approach is made, as well as the subject's awareness of unintentional boundary breaches driven by emotional intensity (Marquez 2013). The experience of the LO and a victim of stalking also varies in important ways, as the LO may be entirely unaware of LI's preoccupation and is

unlikely to consciously experience repeated and persistent intrusions. Whilst limerence and intimacy-seeking stalking share some behavioural overlaps, such as persistent attention and rumination (Wyant 2021), there are fundamental differences in action, risk, and impact.

The differences in the enactment of behaviours that are harmful to the LO or target of stalking may be explained to some degree by the psychopathological correlates of stalking that inhibit self-regulation. Estimates suggest that up to 72% of stalking offenders have a psychopathological diagnosis of some kind (Nijdam-Jones et al. 2018). In the case of intimacy seekers, commonly reported diagnoses include borderline personality, which contributes to unstable interpersonal relationships and a fear of abandonment which, in itself, may contribute to the subject's belief that a relationship with their target is the solution to their own emotional distress (Mullen et al. 2009). Psychotic disorders and cognitive distortions are also noted in the literature (Mullen et al. 2009; Nijdam-Jones et al. 2018), which can impair the ability to realistically perceive and respond to interpersonal cues.

Challenges in responding to interpersonal cues and engaging in stalking behaviour have also been explored through the lens of neurodiversity (Post et al. 2014; Mullen et al. 2009). Interpersonal entitlement has been presented as a correlate, causing the stalker to focus only on their own needs, not recognising the impact of their actions (Mullen et al. 2009; Senkans 2016). It has also been posited that stalking may be an expression of attachment style and that disrupted early attachment leading to insecure attachments in adulthood and an overreliance on others to meet their emotional needs can cause the development of obsessional stalking (MacKenzie et al. 2008; Patton et al. 2010). Meloy (1996) has theorised that a subset of stalkers may exhibit abnormal preoccupied attachment styles that, in simplistic terms, are driven by a combination of a need for validation from an idealised object and feelings of low self-worth—as a result, the idealised object and the associated fantasied 'link' to the self serve to fulfil the narcissistic need for esteem.

However, with less research available on the psychopathological features of limerence, it is hard to make comparisons or draw conclusions from this, beyond observations of similarity and behavioural correlation. In addition, the absence of comparative research also poses a barrier to conclusively identifying how and where limerence sits in the trajectory of harmful stalking pathway behaviours. There has been, however, at least one study that has indirectly identified correlations between stalking and limerence when exploring the narrative experiences of LIs. Qualitative research conducted by Willmott and Bentley (2015) into the experiences of LIs reported that participants experienced a 'disintegration of the self' in which their 'turbulent' and 'uncontrolled' emotions left them feeling 'out of control' and resorting to acts of stalking. These self-professed acts

of stalking occurred when LIs felt a lack of interaction with the LO, inducing a state of panic for the subjects. This suggests that self-regulation in limerent states is only maintained whilst the limerent has some form of direct or indirect interaction (online or offline) with the LO which fuels the one-sided attachment, with the withdrawal or removal of this sense of connection risking the precipitation of breach acts.

Attachment, Rumination, and the Internet

Adult romantic attraction has been characterised as an attachment process (Hazen and Shaver 1987), whereby most people are likely to have one of three attachment styles: secure, anxious, or avoidant. Anxious attachment has also been called ‘preoccupied’ attachment (Bartholomew and Horowitz 1991) and is experienced as desire for another, accompanied by insecurity and preoccupation with the constancy of their partners’ feelings for them. The link between limerence and anxious attachment style has been explored (Feeney and Noller 1990; Wolf 2017) and is based on a shared focus on desire for intimacy and preoccupation with rejection. However, there are some key differences between limerence and anxious attachment. Whereas attachment itself is linked to general expectations of relationships between the self and others, limerence is experienced in monodirectional manner towards one other individual, the LO, rather than as a dispositional style of attachment (Wolf 2017). Limerence has also been defined as an attachment disorder (Sperling 1985) and a separation anxiety disorder (5th ed.; DSM-5; American Psychiatric Association 2013) (Willmott and Bentley 2015). This is due to the level of distress and anxiety that is experienced by the LI when they feel ‘cut-off’ from the LO. This often is typified by desperate desire and a need to maintain all possible attachment ties to the LO, with the feelings experienced when these attachments are broken prompting a state of rumination which is intrinsic to obsessive preoccupations (Banker 2010; Bhar and Kyrios 2005).

Rumination has been defined as ‘a class of conscious thought’ centred on a single theme that is persistent and repeated even in the absence of external cues or demands (Martin and Tesser 1996). This unremitting repetitive thinking is focused on a personal goal or concern. Much work has been done on rumination and its positive and negative impacts on the ruminant (Watkins and Roberts 2020). This observed value is usually associated with the facilitation of success in achieving a goal. However, it is important to consider and apply the opposite, when rumination relates to goals that are unobtainable or unwanted by the target of the goal, such as in the case of limerence or stalking. Rumination has been identified as one of the cognitive mechanisms responsible for the development and

maintenance of mood and anxiety disorders, along with other depressogenic psychosocial factors such as insecure attachment styles and maladaptive interpersonal behaviours (Pearson et al. 2010). Rumination has been consistently found to have a negative effect on existing psychopathology of all kinds, due to consequential magnification of negative mood states, interfering with problem solving and reducing sensitivity to changing external and contextual cues, which is diminished by the distraction of this repetitive thought process (Watkins and Roberts 2020).

The act of rumination directly maintains attention on a desired goal and/or state and in turn repetitively reinforces the discrepancy between that and the current reality. This is a state that is heavily impacted by the way in which people actively engage with each other in a digital age. As a primary mode of communication, socialisation, and means of self-representation, the internet offers a wealth of opportunities to connect with others through the medium of social media apps (Luo and Hancock 2020). It enables us to maintain, re-establish, and seek out new and old relationships (Sprecher et al. 2018), both overtly, through making online ‘connections’, and covertly, via passive observation. These connections are now primarily based around curated image exchange and ‘likes’ engagement (Jang et al. 2015) in which these online spaces, such as Instagram and Facebook, allow others, both known and unknown, to peek into the formulated lifestyle we want others to believe that we lead (Moreton and Greenfield 2022).

As discussed, when LIs are experiencing states of heightened distress and anxiety because of separation from the LO, they disclosed that they turned to the internet, specifically social media, to gain access to the lives of the LO as a means of satiation (Willmott and Bentley 2015; Baitz 2023). As the creators and ‘narrators’ of their online persona, individuals are able to formulate and control a prose to share with the world, often giving very little thought, or none at all, about who is observing us on the other side of the screen, the frequency of their observations, or the feelings that they might be having (or ruminating on) in response to their online presence. The internet, in essence, offers all users the ability to experience limerence from the comfort of our own homes, developing parasocial relationships with people online (the LOs) and pursuing these one-sided relationships whilst remaining hidden thanks to the veil of anonymity that the internet provides (Fox 2022). For LIs, the internet is a vital link to the LO when proximal access is limited by geographical distance, position, and personal constraints. The endless stream of intimate content posted online can provide the LI with the fuel to sustain their fantasies and enable them to formulate a narrative of their own design, facilitating their own solipsistic introjection which is entirely isolated from any direct proximal contact with the LO at all (Suler 2004).

Like limerence, solipsistic introjection is concerned with the development of a fantasy, often created from the limited information we have about another person, based on a tapestry of their imagined behaviours and words. People affected by solipsistic introjection essentially fill in the gaps of their limited personal knowledge about a subject, including their likes and dislikes, their voice, their touch, and mannerisms (Suler 2004). Based on this ‘gap-filling’, it becomes possible to imagine what that person would do in certain situations, including (depending on the context) what it is like to be with them romantically and sexually (Shek 2016). There is no requirement or guarantee of reciprocation involved in solipsistic introjection which, in essence, aligns this practice with the experiences of a person operating in a state of limerence. Solipsistic introjection can be used to explain the process by which a limerent relationship with an LO is developed and maintained. However, it is important to note that not all cases of solipsistic introjection involve prosocial relationships between individuals. Research has shown that solipsistic introjection can be used to explain deviant acts of sexual interaction (Carter 2019) and digital interpersonal violence and abuse (Hellevik 2019), including incidences of stalking and harassment (Short et al. 2022; Cheung et al. 2021).

For the LI, what may begin as harmless fantasies around the romantic attraction and intimate interaction to another person can have the potential to escalate into more harmful and deviant behaviours. There is strong potential for limerent solipsistic introjection to cross a line into more intense levels of rumination which involve obsessive, compulsive, and intense cyberstalking behaviours which can proliferate in unregulated online environments (Stevens et al. 2021; Dhir et al. 2021). In cases of cyberstalking, the context of the digital environment makes interventions or cutting ties through exposure to rejection less likely for the LI, especially if their real identity or the observational behaviours they engage in are kept discrete. Because of these challenges, moderating limerence to avoid transgression into stalking requires a great degree of self-regulation. Self-regulation in cyberspace is challenge for all users, not just those predisposed to obsessive fixations, thanks to factors like anonymity and the tendency towards online disinhibition observable in social interactions that take place online (Suler 2004). Research suggests that the structural features of new communication technologies such as social media apps can facilitate delusional behaviours related to psychosis (Faden et al. 2017). In the digital age, observational behaviours linked with stalking have become normalised to a great degree, albeit at varying levels of intrusiveness (Chayko 2016). The challenge that exists is delineating the line between observational ‘following’ that is benign and casual and those problematic behaviours which are

more aligned with fixation and obsession. Whilst not all LIs are stalkers, it could be argued that all stalkers are Lis, to some extent.

Treatment of Limerence

As discussed, there is no formal diagnosis of the behaviour identified as limerence (Sutherland 2022). This correlates with the notable absence of available treatment or any form of therapeutic guidance related to limerence and may go some way towards explaining the deficit. Research indicates that, in fact, many clinicians report never having heard of limerence, whilst some professionals have tried to use a form of cognitive behavioural therapy (CBT) in which an LI undergoes a treatment known as exposure response prevention (ERP), in which the subject is exposed to separation from the LO or is otherwise presented with a clear and unequivocal rejection (Wyant 2021). The method of effectively separating the individual from the LO is largely dependent on the degree of accessibility of the LO to the individual experiencing limerence.

One rationale for this rejection exposure ‘treatment’ is the relationship between an LI’s desire and the increased dopamine levels that develop as a consequence of minimal interaction between the LO and LI, regardless of how limited or incidental this contact is, alongside the LI’s neurological response to this chemical release (Fisher et al. 2002). Intense romantic feelings have been found to trigger the same physiological responses as gambling addictions (Fisher et al. 2016) with neurological activity centred in the same mesolimbic region (reward centre) of the brain (Wyant 2021). Moments of positive interaction with the LO can result in extreme highs that fuel the behaviour, but in contrast to this, the LI may also experience extreme lows if their affection is rejected (Wolf 2017). The intensity of the LI’s obsessive attachment to the LO is so profound that the act of withdrawal can cause an LI physical pain (Wyant 2021), potentially resulting in self-harm (Tennov 1998) and/or depression (Willmott and Bentley 2015). Experiences of limerence may only be singular in a LI’s lifespan, but they also may also occur multiple times, with multiple LOs becoming the target of a single LI’s unrequited affection. This cognitive state can last for a mere few weeks, or even years (Tennov 1979). Interestingly, the LO does not have to fall into an individual’s typical sexual preferences and may be of any age or gender (Tennov 1998). This suggests that the focus of limerence is not primarily about sexual gratification but rather is more closely linked to forms of obsessive behaviour that can be observed in other clinically recognised disorders.

Conclusion

As this article has highlighted, there is ample need for further exploration of limerence—to better understand not just the condition itself but also its role as a potential precursor to actively harmful behaviours like stalking. It is important to examine limerence in more depth not for the purpose of criminalisation or the deviant labelling of limerent persons per se, but to improve clinical and social responses to a behaviour that can have such a negative impact on the wellbeing of all affected by it, including those who experience it themselves. As outlined, limerence also has the potential to develop into more harmful, interpersonal violence behaviours if left unaddressed and yet currently is not a formal condition that a person is able to seek treatment for as a clinically recognised disorder in the DSM (Sutherland 2022). Discussing limerence openly enables researchers to consider the prologue to stalking, which does not commence immediately with harmful acts, but rather results from a trajectory of increasingly escalating behaviours that transcend beyond the rumination stage and into approach behaviours and/or breach acts, which may result in harm for multiple parties involved.

Thanks to the internet, the act of observing another person without their knowledge or consent has become ubiquitous and normalised—it is, in effect, the operating business model of many popular social media platforms and apps such as Instagram, Facebook, TikTok, and even professional networks like LinkedIn. For most of us, this behaviour does not go beyond natural curiosity and devolve into the kind of states observable in people experiencing limerence, whereby the object of interest begins to consume a person's everyday lives and thoughts become obsessive and/or intrusive. Whilst limerence shares many traits that are intrinsic to stalking, individuals in a limerent state have not yet progressed (or may not *ever* progress) into escalated behaviours and acts that are harmful to another person, other than the subject who is experiencing the limerent state themselves. The characteristics of limerence do not fall comfortably within the parameters of any existing clinical disorder such as erotomania or OCD, nor is it possible to determine if there is any correlation between ADHD and limerence due to a deficit of existing research on the subject. Even so, *prima facie* behavioural correlations can be drawn from examining the features of limerence that indicate that this is an area worthy, and in much need, of further research.

The position that limerence is a precursor to stalking cannot be assumed, and further investigation of this topic may demonstrate that a limerent state does not progress to stalking behaviours in all cases. It is important to identify psychological traits inhibiting stalking and promoting

self-regulation, such as locus of control which influences both motivation and behaviour in individuals and has some predictive power in the degree of control and ownership people have over their actions (Rotter 2017). This distinct construct continues to be useful in predicting actions and motivations in contemporary literature and may be appropriate here. Another area of research which should be explored is the extent to which LIs engage in stalking behaviours that are unknown to their LO and what factors enable these behaviours. Legal classifications of stalking only come into play once a victim has voiced that they are feeling alarmed, are distressed, and have met a 'standard of fear' because of the unwanted contact that they are experiencing. This raises the question of how to account for a pattern of covert behaviours that a victim is unaware of, but where they are nevertheless being observed and fixated upon.

If limerence is shown to be a precursor for stalking behaviours, this is essential to examine, considering such passive actions may present an opportunity for more proactive intervention. It is also important to conduct more research into the experiences of LIs to determine their commonalities and differences, as well as factors that inhibit and facilitate self-regulation and influence their mental wellbeing. Further research should explore how the state of limerence destabilises the lives of those who are impacted by it and how this relates to the views they hold about themselves and others. There is a wealth of research opportunities that remain to be explored related to the phenomenon of limerence. The challenge for researchers will come from accessing the lived experiences of LIs, a population that has historically eluded clinical categorization. In addition, the somewhat passive monodirectional nature of limerence is such that, for many LIs, the behaviours discussed here have been practised in a highly clandestine manner for a prolonged period of time. However, overcoming these barriers is crucial to building the literature base on limerence and, in doing so, enhancing knowledge on the subject.

Data Availability There was no data analysed in this review article.

Declarations

Competing Interests The authors declare no competing interests.

Human and Animal Rights and Informed Consent This article does not contain any studies with human participants or animals performed by any of the authors. Therefore, there is no informed consent to seek.

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