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The social route to mental health: A systematic review and synthesis of theories linking social relationships to mental health to inform interventions

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ARTICLE INFO

ABSTRACT

Interventions that support social relationships are widely used to promote mental health and increasingly involve the use of digital technologies. Solid theoretical underpinning is crucial for interventions to achieve the intended outcomes and avoid unintended consequences. Several theories linking social relationships to mental health exist in the literature but plurality and overlapping elements complicate the choice of appropriate theory. The aim of this study was to systematically review and synthesize theories linking social relationships to mental health to extract key theoretical assumptions to explain 1) how social relationships influence mental health, and 2) the circumstances that distinguish beneficial social relationships from relationships that have no effects or cause harm. Results of the synthesis are discussed in relation to general interventions, and implications for the use of digital interventions as novel tools to support social relationships and mental health are drawn out. The systematic search was performed in five electronic databases: PubMed, Sociological Abstracts, PsycINFO, CINAHL, and Embase. Six theoretical frameworks met our inclusion criteria and were included in the synthesis. The theory synthesis followed three stages: 1. synthesis preparation, 2. synthesis, and 3. synthesis refinement. Findings show that various social relationships influence people's mental health, both in adverse situations and in those without adversities. Their impact is shaped by a complex interplay of individual and relational circumstances and the individual's subjective perceptions. Quality and content are central to separating beneficial relationships from those that are not beneficial. Findings support the potential of interventions based on social relationships to improve mental health but highlight the need to consider the circumstances where relationships might do more harm than good. Digital interventions may improve people's opportunities to develop new relationships or strengthen existing ones, but they require a special focus on ensuring the quality and content of relationships to maximize this potential benefit.

1. Introduction

Researchers have long pointed out the crucial role that social relationships play in people's mental health and well-being (Baumeister & Leary, 1995; Cacioppo & Patrick, 2008; Cacioppo & Cacioppo, 2014; Holt-Lunstad & Smith, 2012; Kawachi & Berkman, 2001; Saeri, Cruwys, Barlow, Stronge, & Sibley, 2018; Thoits, 2011). Thus, adhering to WHO's definition of mental health (Herrman, Saxena, & Moodie, 2004), salutary social relationships are central to the '*state of well-being in which the individual realizes his or her own abilities, copes with the normal stresses of life, works productively, and fruitfully, and makes a contribution to his or her community*'. This insight has been accentuated during the global COVID-19 pandemic, also referred to as 'the pandemic of loneliness', with its periods of lockdown, social disconnectedness, and loneliness (Shah, Nogueras, van Woerden, & Kiparoglou, 2020b).

In recognition of the salutary effect of social relationships, interventions that support these have been suggested as valuable tools to promote public health, including mental health (Saeri et al., 2018; Umberson & Karas Montez, 2010). Mental health promotion is concerned with strengthening the protective factors for positive mental health, including subjective well-being and affective balance, and the development of abilities to manage life, maximize one's potential, participate in,

and contribute to society (Barry, Clarke, Petersen, & Jenkins, 2019). In relation to this, social relationships may function as protective factors offering, for instance, a sense of belonging or social support (Barry et al., 2019).

However, there are numerous challenges to the design of effective interventions to promote social relationships and mental health. These include a need to address a lack of strong theoretical foundations (Cohen, 2004; Feeney & Collins, 2015; Haslam, Cruwys, Haslam, Dingle, & Chang, 2016; Thoits, 2011) and a lack of knowledge on the exact nature of the mechanisms that link social relationships to mental health (Feeney & Collins, 2015; Kawachi & Berkman, 2001; Lincoln, 2000; Thoits, 2011; Uchino, Bowen, Carlisle, & Birmingham, 2012). Considering that not all interventions have achieved their intended effects and that social relationships in some cases cause more harm than good (Cohen, 2004; Kawachi & Berkman, 2001; Lincoln, 2000; Rook, 1984; Sani, 2012; Thoits, 2011; Umberson & Karas Montez, 2010; Villalonga-Olives & Kawachi, 2017), a solid theoretical underpinning is crucial for the design of interventions to achieve improvements in mental health and to avoid unintended consequences (Merton, 1936; Skivington et al., 2021). Theorizing interventions is in accordance with recommendations from the UK Medical Research Council's framework on developing complex interventions (Skivington et al., 2021).

Stiving for theoretical clarity on the complex mechanisms linking social relationships to mental health and well-being, a large number of theories and conceptual maps and models have been developed over recent decades (e.g., Baumeister & Leary, 1995; Berkman, Glass, Brissette, & Seeman, 2000; Cohen & Wills, 1985; Feeney & Collins, 2015; Haslam et al., 2012; Jetten et al., 2017; Lakey & Orehek, 2011; Mikulincer & Shaver, 2008; Thoits, 2011). The number of theories, and the fact that many of them overlap, although their focus on the beneficial aspects of social relationships differs (e.g., belonging, social support, social identity etc.) complicates the task of identifying the most appropriate theory for intervention development. This may result in a lack of theoretical insight into the complexity of the problem that interventions should help to improve, and may increase the risk of failure; a criticism that has been made previously in relation to the development of social support interventions (Cohen, 2004; Thoits, 2011).

For theory-driven interventions, researchers have argued for the need to consider a broad range of potential theoretical perspectives on a particular population health problem. There have been criticisms of the use of a popular "off-the-shelf-theory" that may be widely used but does not provide an adequate explanation of essential mechanisms in specific interventions (Moore & Evans, 2017). To support the choice and application of appropriate theory for the development of interventions in which social relationships are used to improve mental health, there is a need to increase the accessibility of theories, to make visible the key perspectives that the theories have in common as well as those that differ, and to discuss the implications for the practical design of interventions. Theory synthesis, defined as the *'activity of comparing and weaving together specific, related theories of interest'* (Pound & Campbell, 2015) has been described as a particularly feasible method in fields where the amount of theory is vast. Also, this approach has the potential to increase the robustness of theory and to make these theories accessible to practical application (Pound & Campbell, 2015).

An increased focus on established theories linking social relationships to mental health may be particularly critical for the design of digital interventions to promote mental health. Recent years have seen a trend towards the use of digital technologies in interventions to support social relationships and mental health often targeting older adults with a focus on reducing loneliness and improving social connectedness (see Ibarra, Baez, Cernuzzi, & Casati, 2020 for a systematic review). In addition to this, the COVID-19 pandemic has focused greater attention on the relevance of digital tools to mitigate the negative consequences of the resulting social isolation and loneliness (e.g., Gallucci et al., 2020). Research that points to a lack of theoretical underpinning in digital interventions to explain varying results (Barbosa Neves, Waycott, &

Maddox, 2021; Khosravi, Rezvani, & Wiewiora, 2016), supports the need for careful use of theory to strengthen efficiency and avoid unintended consequences of applying these novel tools.

Thus, the overall objective of this study was to contribute to an understanding of the theoretical basis of interventions based on social relationships to promote mental health. The study aimed to systematically review and synthesize theories linking social relationships to mental health to extract key theoretical assumptions to explain 1) how social relationships influence mental health and 2) the specific circumstances that distinguish beneficial social relationships from relationships that have no effects or cause harm. Results of the synthesis are discussed in relation to general interventions, and implications for the use of digital interventions to support social relationships and mental health are drawn out.

2. Method

To identify theories, a systematic approach using formal search procedures was used following PRISMA guidelines (Page et al., 2021). Searching for theories systematically has been described as an area of growing methodological advancement (Campbell et al., 2014), and we were inspired and guided by the methodological advancements made by others (Bonell et al., 2013; Booth & Carroll, 2015; Campbell et al., 2014; Lorenc et al., 2012; Pound & Campbell, 2015; Whitehead et al., 2016).

The search strategy was inspired by the BeHEMoTh framework developed by Booth and Carroll (2015) for the systematic identification of theories. Furthermore, an experienced university information specialist was consulted. The search was based on the following research question: *'Which middle-range theories explain the influence of social relationships on mental health?'* which was adapted to the BeHEMoTh question formulation. The search string included *mental health* (Be – Behavior of interest) AND *social relationships* (H – Health context/intervention) AND *Models or theories* (MoTh). Due to a lack of consensus in the literature on the definition of social relationships, a broad strategy was chosen that included diverse conceptualizations of this term. Search terms associated with both structural and functional aspects of social relationships were identified through a reference search prior to the systematic search. These included: belonging, social identity, social identification, social integration, social inclusion, social group, group membership, social capital, social support, social ties, social connection, social network, and social relationship. We systematically searched the electronic databases: PubMed (last searched 4 July 2018), Sociological Abstracts (last searched 3 July 2018), PsycINFO (last searched 3 July 2018), CINAHL (last searched 4 July 2018), and Embase (last searched 4 July 2018). In accordance with PRISMA guidelines, search strategies for all databases are presented in appendix A.

To be included in the review, the material had to explicitly describe middle-range theories on the influence of social relationships on mental health. The identification of theories was guided partly by the understanding of theory provided by Sutton and Staw (1995) which states: *'Theory is the answer to queries of why. Theory is about the connections among phenomena, a story about why acts, events, structure, and thoughts occur. Theory emphasizes the nature of causal relationships, identifying what comes first as well as the timing of such events'* (p.8). Partly, it was guided by Merton's understanding of middle-range theories as theories that lie between the minor working hypotheses that evolve in day-to-day research and the all-inclusive unified theories (Merton, 1967). Finally, we drew on Van Ryn and Heaney's characterization of theories as generalizable across settings and populations and as empirically testable (Van Ryn & Heaney, 1992). Based on this, middle-range theories (presented in peer-reviewed articles or books or book chapters) were included if they presented original explanations for the influence of social relationships on mental health and if, furthermore, they were testable and generalizable. Empirical studies where theory was either not used, only briefly mentioned, or used as frameworks for interpretation were excluded. Also, materials presenting hypotheses, models, and conceptual

frameworks that did not explicitly include *explanations* of the influence of social relationships on mental health were excluded. Finally, due to the requirement of generality, material that was highly specific to one particular group (e.g., people with depression) was excluded. Due to this review's focus on the influence of social relationships, theories that did not focus on this were excluded. This also included theories focusing primarily on the negative influence of social deprivation on mental health e.g., loneliness theory (e.g. Hawkley & Cacioppo, 2013). Only material in English was included, but this did not lead to the exclusion of theories.

The screening was done using the software tool Covidence that has been designed for systematic reviews (Harrison, Griffin, Kuhn, & Usher-Smith, 2020). Two reviewers from the field of sociology and anthropology (LMBA and ANR) independently screened articles based on predefined criteria. Disagreements were reconciled through discussion with the research team. The search retrieved 5281 articles, which were reduced to 4536 when duplicates were removed (Fig. 1). Subsequently, 110 articles were full-text screened for eligibility based on the indication of theoretical material in title or abstract. Six theories met our predefined inclusion criteria and were included in the synthesis. Five of these were

presented in peer-reviewed articles whereas one was presented in a book chapter.

The synthesis of theories was inspired by the three stages for theory synthesis suggested by Pound and Campbell (2015). Stage 1: *Synthesis preparation* involved extraction and summary of relevant parts of the theories explaining the positive influence of social relationships on mental health. In stage 2: *Theory synthesis,* theories were compared for points of convergence and divergence based on the six key aspects illustrated in Box 1, focusing mainly on bringing together those parts of the theories that converged (Table 2). The six key aspects were generated deductively based on the study aim and inductively based on themes appearing in the theories. Finally, stage 3: *Synthesis refinement,* involved the interrogation of the theories for further theoretical insights. In this stage, theory synthesis was first revisited to provide an overall picture of the insights gained from the synthesis in relation to the study aim (Fig. 3). Secondly, theories were explored separately to suggest theory-driven goals for interventions based on social relationships to positively influence mental health (Table 3). To allow for synthesis, the included theories were imported to NVivo 12 for Windows and coded thematically with inspiration from Braun and Clarke (2006).
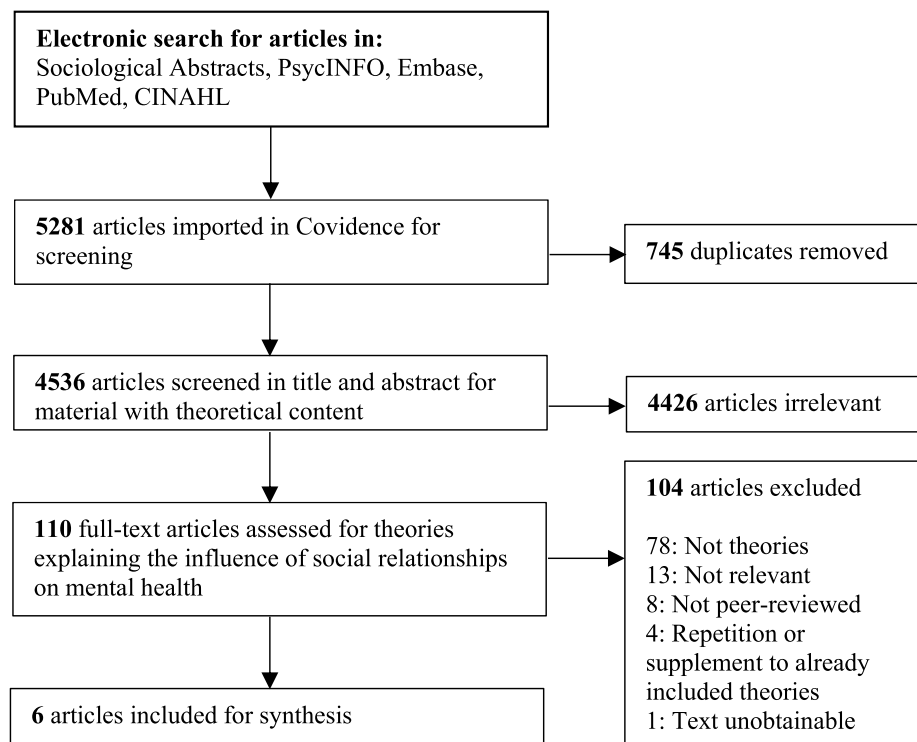
Fig. 1. PRISMA flowchart.

Box 1
Key aspects around which the theories were compared for points of convergence and divergence.

1. The types of social relationships that the theories focus on to explain the influence on mental health.
2. Overall explanation of the positive influence of social relationships on mental health, including:
    2.1: How social relationships influence mental health positively in times of adversities.
    2.2: How social relationships influence mental health positively irrespective of adversities.
3. The character of social relationships that may influence mental health positively.
4. The character of social relationships that may influence mental health negatively – or may have no effect.
5. How subjective perceptions influence the impact of social relationships on mental health.
6. How individual differences influence the impact of social relationships on mental health.

3. Results

The systematic search identified six theories that explained the influence of social relationships on mental health (Table 1): *Social Support and Buffering Theory* (Cohen & Wills, 1985), *Need to Belong Theory* (Baumeister & Leary, 1995), *Adult Attachment Theory* (Mikulincer & Shaver, 2008), the *Social Cure* approach (Jetten et al., 2017), *Thriving Through Relationships Theory* (Feeney & Collins, 2015) and *Relational Regulation Theory (RRT)* (Lakey & Orehek, 2011). Several of these theories drew on each other and also on other middle-range theories such as Social Identity Theory (Tajfel & Turner, 1979) and Attachment Theory (Bowlby, 1969). Fig. 2 illustrates the connections between the theories that were retrieved with the systematic search (Table 1. *Included material*) and connections to other middle-range theories that the included theories drew upon, but which were not retrieved with the systematic search nor included in the theory synthesis.

Table 1
Theoretical approaches presented in the included material.

Included material	Theoretical approach
The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation (Baumeister & Leary, 1995)	Need to Belong Theory
Advancing the Social Identity Approach to Health and Well-being: Progressing the Social Cure Research Agenda (Jetten et al., 2017)	Social Cure approach
Stress, Social Support, and the Buffering Hypothesis (Cohen & Wills, 1985)	Social Support and Buffering Theory
Relational Regulation Theory: A New Approach to Explain the Link Between Perceived Social Support and Mental Health (Lakey & Orehek, 2011)	Relational Regulation Theory
A New Look at Social Support: A Theoretical Perspective on Thriving Through Relationships (Feeney & Collins, 2015)	Thriving Through Relationships Theory
Adult Attachment and Affect Regulation (Mikulincer & Shaver, 2008)	Adult Attachment Theory

3.1. Synthesis preparation

In this section, guided by the methodology of Pound and Campbell (2015), extracted parts of the included theories were narratively summarized with a focus on their overall explanations for the positive influence of social relationships on mental health.

3.1.1. Social Support and Buffering Theory

Cohen and Wills (1985) explain the beneficial effect of social relationships on well-being through the provision of support. The theory proposes two different models: the buffering model and the main effect model. The buffering model suggests that supportive relationships buffer the individual against the negative and potentially pathological effects of stressful events by their provision of support functions; esteem support (communication that a person is valued and accepted); informational support (help in defining, understanding, and coping with events); social companionship (spending time with others), and instrumental support (provision of financial aid, material resources, and needed services). The main effect model suggests that, regardless of stress, being integrated in a large social network is beneficial to well-being since it provides people with stable and socially rewarding roles in the community and regular positive experiences.

3.1.2. Need to Belong Theory

Baumeister and Leary (1995) unfold the hypothesis that humans are driven by a basic need for belongingness to form and maintain interpersonal relationships with others. The focal point of the theory is that social relationships affect people's well-being due to their potential to satisfy this need. Consequently, people who lack these important social bonds experience adverse consequences including signs of maladjustment, stress, and psychological pathology. The theory suggests that people's belongingness status is closely linked to their emotional lives. Forming new social bonds, for instance, causes people to feel pleasure and positive affect whereas threats to belongingness, for example when relationships are lost, broken, or refused are a source of negative affect.

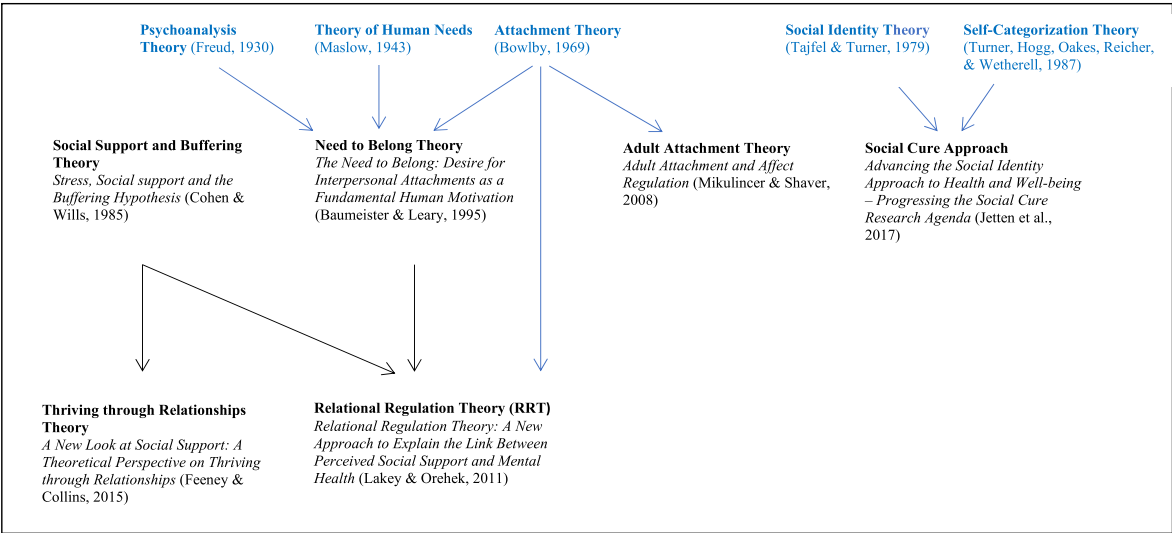**Fig. 2.** Connections between the theories that were included in the theory synthesis (marked with black) and other middle-range theories that the included theories drew upon, but which were not retrieved with the systematic search nor included in the theory synthesis (marked with blue). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)
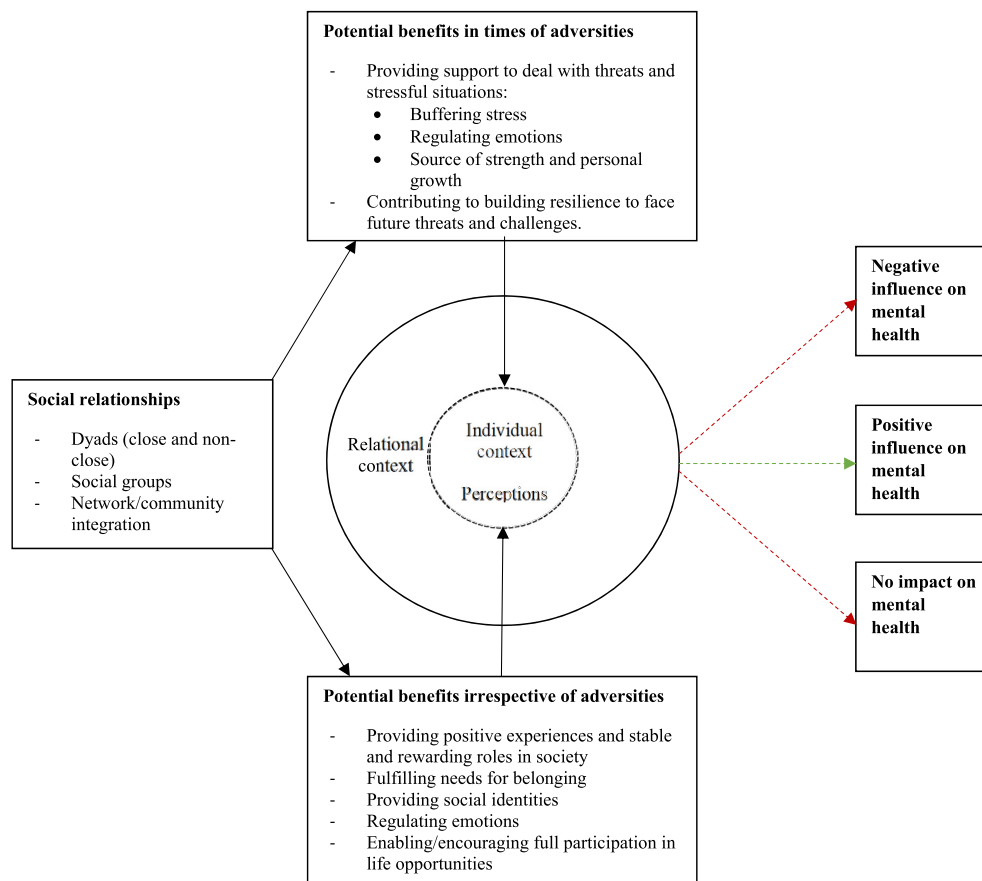
Fig. 3. How social relationships influence mental health. Visualization of key findings from the theory synthesis.

3.1.3. Relational Regulation Theory

Lakey and Orehek (2011) present a theory that explains how the beneficial effect of perceived social support on mental health is rooted in social interaction. According to this theory, people need to have at least a few ongoing social relationships to maintain their emotional well-being. Social relationships become rewarding to mental health because ordinary interaction with other people in shared activities and conversation (e.g., discussion of positive events and in troubled talk) helps people regulate their affect, thought, and action. Emphasizing relational influences, the theory suggests that how well people regulate each other depends on whether they match in their personal tastes in terms of preferred styles of talking, thinking, feeling, and acting for specific contexts.

3.1.4. Thriving Through Relationships Theory

Feeney and Collins (2015) offer a theory that focuses on the interpersonal dyadic processes by which close social relationships affect peoples' thriving through their provision of social support. The theory distinguishes between two different relational support functions that promote thriving in two different life contexts. Source of Strength support (SOS support) promotes thriving through adversity by offering comfort and protection while also supporting the individual to develop strengths and flourish from adverse experiences. Relational Catalyst support (RC support) promotes thriving in the absence of adversities by promoting engagement in life opportunities.

3.1.5. Adult Attachment Theory

Mikulincer and Shaver (2008) highlight the emotion regulation

function of attachment relationships in adult life as an important mechanism through which social relationships affect mental health. The theory proposes that the availability of responsive attachment figures and mental representations of positive attachment experiences activate mechanisms that lead to positive effects on mental health. This process is called the 'broaden-and-build' cycle of attachment security and is suggested to strengthen the individual's resources to deal with stressful situations and to broaden the individual's capacities and development.

3.1.6. The Social Cure approach

In 15 key hypotheses, Jetten et al. (2017) unfold the social identity approach to health and well-being, also known as the Social Cure approach. The focal point of this approach is that group memberships, given that they provide members with positive social identities, have the power to act as 'social cures' because they provide people with psychological resources such as a sense of connectedness; common direction, meaning, purpose, and worth; social support; and collective efficacy, agency, and power. Thus, they provide strength for people to overcome and fight back against life adversities.

3.2. Synthesis of theories

In this section, theories were firstly compared to identify theoretical differences and similarities in relation to the six key aspects listed in Box 1. This process is illustrated in Table 2 with each row corresponding to one of the six key aspects. Theories were then woven together narratively in relation to each aspect.

Table 2

Theories compared for points of convergence and divergence based on the six key aspects listed in Box 1.

	Baumeister and Leary (1995) Need to Belong theory	Jetten et al. (2017) Social Cure approach	Cohen and Wills (1985) Social Support and Buffering Theory	Lakey and Orehek (2011) Relational Regulation Theory	Feeney and Collins (2015) Thriving Through Relationships Theory	Mikulincer and Shaver (2008) Adult Attachment Theory
1. Types of social relationships that the theories focus on to explain the influence on mental health	Close relationships and social groups.	Social groups.	Support providers (buffering effect). Integration in social networks (main effect).	Dyads, conversation partners.	Close relationships (family, friends, intimate partners), dyads.	Close relationships, attachment figures in adult life (parents, spouse/partners).
2. Overall explanation of the positive influence of social relationships on mental health	Social relationships influence mental health and well-being through their potential to fulfill the fundamental human need for belongingness.	Group memberships are beneficial to health and well-being because they provide individuals with social identities that unlock psychological resources.	Social relationships influence mental health and wellbeing through the provision of different types of social support.	Social relationships are beneficial to mental health because they enable people to regulate their affect, thoughts, and actions through ordinary day-to-day conversations and activities.	Close personal relationships promote optimal thriving and well-being by providing two specific support functions in two life contexts. In turn, this contributes to the long-time thriving of the individual.	The availability of attachment figures and mental representations of attachment experiences (attachment security) in adult life influence mental health by increasing a person's resources for dealing with life tasks and challenges and promoting personal development.
2.1 How social relationships influence mental health positively in times of adversities	Not concerned with this	Social identities provide psychological resources, which give strength to overcome adversities in life and to fight back. Psychological resources: 1. Sense of social connection. 2. Common direction, meaning, purpose, worth. 3. Social support. 4. Sense of collective efficacy, agency, and power.	Social relationships protect the individual against stress and the consequences of stressful experiences by their providence of support functions (buffering process): Social support functions that operate as stress buffers: 1. Esteem support 2. Emotional support 3. Informational support 4. Social companionship	Social relationships influence mental health positively in stressful circumstances when people interact with others (troubled talk) for regulation of emotion, thought, and actions.	Close social relationships promote thriving in the context of adversity by providing Source of Strength support (SOS support). This support enables people to cope successfully with adversities and to grow from the experience. Source of Strength support promotes thriving by affecting the individual's: a) emotional state, b) self-evaluations, c) appraisals of the situation/event, d) motivational state, e) situation relevant behaviors/outcomes, f) relational outcomes, g) neural activation/ psychological functioning, h) lifestyle behaviors.	The availability of actual and mental representations of attachment figures produces the *broaden-and-build cycle* that enables the individual to maintain a confident and calm state of mind dealing with life tasks and challenges and thus affects emotional regulation and mental health positively. Mechanisms that underlie the broaden-and-build circle: 1. Positive life appraisals 2. Positive mental representations of others 3. Authentic forms of positive self-views 4. Constructive coping strategies
2.2 How Social relationships influence mental health positively irrespectively of adversities	Having close social ties and belonging to social groups, regardless of whether these provide explicit assistance or not, has a positive influence on mental health due to fulfilling the basic human need for belongingness.	Positive social identities derived from group memberships influence positively on people's well-being and self-esteem.	Being integrated in a large social network affects well-being positively in the absence of stress because it provides people with stable and socially rewarding roles in the community and regular positive experiences, thus offering a sense of predictability and stability, recognition of self-worth, and help to avoid negative experiences (main effect process)	Social relationships affect mental health via ordinary day-to-day interactions (conversation, and activities) that enable people to regulate their affect, thought, and action.	Close social relationships promote thriving in the absence of adversities by providing Relational Catalyst support (RC support). This supports people in engaging in life opportunities for personal growth and development which gives purpose and meaning in life. Relational Catalyst support affects the individual through the same mechanisms as Source of Strength support (2.1).	Attachments figures' availability and the mental representations of attachment figures function as a secure base that enables the individual to engage in activities for personal development and growth.

Table 2 (*continued*)

	Baumeister and Leary (1995) Need to Belong theory	Jetten et al. (2017) Social Cure approach	Cohen and Wills (1985) Social Support and Buffering Theory	Lakey and Orehek (2011) Relational Regulation Theory	Feeney and Collins (2015) Thriving Through Relationships Theory	Mikulincer and Shaver (2008) Adult Attachment Theory
3. The character of social relationships that may influence mental health positively	A few ongoing non-aversive, significant personal relationships marked by stable caring and concern and frequent interaction.	Social groups that provide positive social identities. Multiple group memberships, if they are compatible, important for the individual and positive, provide more psychological resources to protect health and well-being.	Social relationships that provide support that matches the needs elicited by a stressful event. Adequate support for stress buffering may be derived especially from close relationships.	Relationships that regulate affect in the widest range of circumstances. This is a matter of personal taste. People who share similarities in terms of values, activities, and attitudes should be more effective in regulating each other.	Close meaningful relationships that provide responsive and sensitive SOS and RC support. People should be embedded in a network of responsive relationships. Relationships characterized by mutual responsiveness are optimal.	Sensitive and responsive attachment figures that effectively regulate emotions and restore a person's sense of security when needed.
4. The character of social relationships that may influence mental health negatively – or may have no effect	Conflicting relationships are less beneficial and sometimes harmful. Interactions with strangers or with people a person dislikes or hates fail to satisfy the need for belongingness. Negative affect follows when social bonds are broken, threatened, or refused.	Social groups can be a social "curse" if they are compromised (e.g., stigma, failure, low status), if they promote toxic or unhealthy norms, or if they are unsupportive.	If support is not perceived as adequate it does not operate to buffer the individual from stressful events. Network conflict may cause negative effects. Costs may be related to receiving and giving social support.	Some social interactions elicit negative thinking and affect. People may not regulate each other effectively. Some conversations topics may dysregulate.	Social relationships that provide poor quality support (i.e., unresponsive and insensitive support) undermine thriving by promoting either overdependence or under-dependence.	Experiences with unavailable attachment figures lead to secondary (insecure) attachment strategies that damage emotion regulation and contribute to psychological problems. They are furthermore risk factors for reduced resilience in times of stress and may inhibit attempts to create close and rewarding relationships.
5. How subjective perceptions influence the impact of social relationships on mental health	For social bonds to satisfy the need for belonging, they must be perceived as stable with continuation into the future and marked with affective concern.	To unlock the psychological resources to affect health and well-being, the individual must identify with the group. The group must be perceived as meaningful and relevant to the individual. Perception of the status of the social group determines if group memberships are rewarding.	Social support must be perceived as adequate by the recipient to buffer stress.	People differ in whom and what they perceive as supportive. A person who is perceived as unsupportive is avoided and the relationship is not effective in regulating the individual.	The recipient's perception of support provided by others mediates the link between the support and the immediate experienced outcomes.	Individuals' history of interactions with available responsive attachment figures may influence their perceptions, intentions, and behavior. This affects whether a person will seek support and whether social relationships become rewarding in regard to effective affect regulation.
6: How individual differences influence the impact of social relationships on mental health	Individuals differ in their motivation to form new social relationships. For people with saturated belongingness needs forming additional social bonds makes less of an impact compared to people with unsaturated needs.	Not concerned with this	Individuals and groups differ in their support needs and therefore benefit differently from support functions provided by others or from social integration.	Whether a social relationship is effective in regulating people's affect depends on the personal taste of the individual. People differ in preferred levels of affect, action, and thought for specific contexts.	Individual differences are influential and likely to moderate the pathways between SOS and RC support and thriving. People for instance differ in the extent they provide or seek support and in how they perceive and react to other's behavior.	Individuals differ in attachment security. This makes them differ in whether not they will seek support in times of need and in their ability to create close and rewarding relationships.

3.2.1. Types of relationships that influence mental health

A person's mental health is affected by different types of relationships. Some of the included theories emphasize the beneficial impact of *close* relationships. Adult Attachment Theory, for instance, is concerned with the close relationships that people have with attachment figures such as partners and parents. Need to Belong Theory centers around the importance of close personal relationships and Thriving Through Relationships Theory highlight the influence of the close relationships that people have with family, friends, and intimate partners and points out that, optimally, the individual should be integrated in a complex network of responsive relationships. Other theories focus on the impact of social relationships that are not necessarily the closest or most significant ones. Relational Regulation Theory, for instance, emphasizes the influence of support processes happening in dyads (i.e., groups of two people) with, for example, shifting conversation partners in everyday life. The Social Cure approach focuses on the benefits of belonging to social groups. Social Support and Buffering Theory focuses on supportive relationships without further specification of the types of relationships involved and furthermore emphasizes the beneficial influence of being integrated into social networks. Thus, taking all the included theories into account it may

be argued that mental health is affected by the most intimate and close relationships people have with family and friends, the social groups they belong to, as well as by their integration into the larger social community.

3.2.2. Explanations of the positive influence of social relationships on mental health

Positive social relationships play a crucial role in mental health and thriving whereas the lack of such contributes to poor mental health. This is clearly stated by Cohen and Wills (1985): *'at a general level, it can be posited that a lack of social relationships leads to negative psychological states such as anxiety and depression' (p. 311)*. The theories vary in their explanation for this, but together they seem to represent an echo of Emile Durkheim's well-known work, Suicide: A study in Sociology, in which he hypothesized that belonging to a group meets the need of the individual to be a part of something bigger and enables individuals to share in the group's resources to stand strong through challenges in life (Durkheim, 2002). In other words, both a *need perspective* and a *resource perspective* are represented. The need perspective is strongly emphasized in Need to Belong Theory that hypothesizes that the beneficial influence of social relationships happens from meeting the basic human need for belongingness. Furthermore, Relational Regulation Theory and Adult Attachment Theory, both based on the work of Bowlby (1969), explain the beneficial role of social relationships with the roles that these play in meeting people's needs to regulate their emotions to maintain mental health. The resource perspective captures the idea that social relationships benefit mental health by providing access to resources to protect or promote mental health. This perspective is evident in Social Support and Buffering Theory that argues that social relationships benefit the individual by providing support functions to protect the individual against the adverse consequences of stressful events. Inspired by Social Support and Buffering Theory, Thriving Through Relationship Theory highlights that support functions provided by close others, both in times with and times without adversities, promote people's thriving. Finally, The Social Cure approach argues that social group memberships provide people with psychological resources to overcome threats and challenges in life to protect health and well-being.

3.2.2.1. How social relationships influence mental health positively in times of adversities.
Together the included theories propose that social relationships can benefit the individual both when it comes to dealing with adversities in terms of threats and challenges in life, but also irrespective of adverse circumstances. In times of adversities, social relationships may influence mental health positively by enabling people to cope with, successfully adjust to, fight back against, and overcome these adversities. One of the ways in which social relationships may benefit people is by providing support when needed. This perspective is emphasized by Adult Attachment Theory suggesting that support provided by attachment relationships in adult life plays an important role in restoring a sense of security and providing relief and positive affect in a person dealing with threatening circumstances. Social Support and Buffering Theory adopt a similar perspective regarding the role of support provided in the encounter with stressful events. The theory proposes that supportive relationships may help to buffer stress by influencing the way people experience a potentially stressful event and the person's perceived ability to cope with the demands of the situation. Social support provided in times of adversities may, however, also provide a source of resilience and personal growth. This perspective is evident in Thriving Through Relationships Theory which explains that support provided by people's close relationships in times of adversities may, besides buffering stress, also enable them to thrive despite these adversities. Finally, social support may also contribute to the building of resilience to face future threats and challenges. According to Thriving Through Relationships Theory, for instance, social support contributes to people's long-term thriving and improves their ability to cope and counter adversities as Feeney and Collins (2015) explain: *'Individuals who are thriving in all the*

ways described previously (…) should experience, perceive, and approach adversities and opportunities in a more proactive and healthy manner than individuals who are not thriving' (p. 129)*. Similar ideas apply in Adult Attachment Theory, arguing that repeated encounters with responsive attachment figures produce and sustain the *broaden-and-build cycle,* a process that builds on the individual's resources to maintain a calm and confident state of mind when dealing with life's tasks and challenges, thus affecting mental health positively. Finally, with an emphasis on the power of social groups, the Social Cure approach argues that social group memberships, in particular the social identities derived from these, 'unlock' psychological resources in terms of sense of connectedness; meaning, purpose, and worth; social support; and collective efficacy, agency, and power that enable people to stand strong through times of adversities.

3.2.2.2. The beneficial influence of social relationships on mental health irrespective of adversities.
Social relationships also hold benefits for mental health irrespective of adversities. Social Support and Buffering Theory, for instance, propose the main effect model to explain how being integrated in a large social network benefits the individual's well-being irrespective of adversity by providing people with regular positive experiences and a set of stable and socially rewarding roles in society. Another way in which social relationships may benefit irrespective of adversities is by enabling people to meet their needs for belongingness. Need to Belong Theory suggests that because the need for belonging is a fundamental human need, whether this need is fulfilled or not (or is even threatened) is closely linked to a person's emotional states. Belonging to a social network also enables people to have conversations and share activities with others. Relational Regulation Theory suggests that day-to-day interactions with other people are beneficial irrespective of adversities because they function to regulate people's actions, thoughts, and emotions. Finally, social relationships may function as a secure base that enables individuals to explore the world and act as a catalyst for personal growth and building up resources. Inspired by the work of Bowlby (1969), Adult Attachment Theory and Thriving Through Relationships Theory agree on this perspective. Thriving Through Relationships Theory, for instance, emphasizes support provided in close social relationships in times without adversities (i.e., Relational Catalyst support) which promotes thriving by enabling people to participate in opportunities for fulfillment and personal growth. This is explained by Feeney and Collins (2015): *'Supportive relationships can help people thrive by promoting engagement in opportunities that enable them to enhance their positive well-being by broadening and building resources (Bowlby, 1988; Fredrickson, 2001) and finding purpose and meaning in life (Ryff & Singer 1998)' (p. 119)*.

3.2.3. The character of social relationships that influence mental health positively or negatively

Not all types of social relationships influence mental health positively. Baumeister and Leary (1995) for instance describe: *'the mere fact of a social bond is not enough to protect people from these problems and pathologies' (p. 515)* and similarly, Jetten et al. (2017) notes: *'(…) social identities may become a curse, threatening and potentially harming health and well-being' (p. 789)*. While some social relationships may promote mental health, others may be detrimental and hinder the individual from thriving. Furthermore, some relationships may not affect at all. Taken together, the theories suggest that quality and relational content matter significantly for their beneficial influence on mental health. Reflecting two sides of the same coin, negative and positive aspects of social relationships regarding their influence on mental health (Table 2, key aspects 3 and 4), are here presented together in opposition to each other.

3.2.3.1. Relationships that provide support versus unsupportive relationships.
One of the things that influence whether social relationships are beneficial to mental health is whether they provide support, not just

objectively, but also whether they are perceived as doing so. Almost all the reviewed theories agree that relationships that do not provide support or provide support that is not perceived as supportive, are less beneficial and may even be harmful to mental health. This is emphasized in Adult Attachment Theory which argues that the most rewarding relationships are the ones that effectively provide support to regulate emotion and restore a person's sense of security when dealing with threats and challenges. In line with this suggestion, insecure attachment caused by repeated experiences of unavailable and unreliable attachment figures from childhood, and strategies developed to deal with this, damage the individual's confidence in seeking support from others to deal with stressful situations and threats. This limits the individual's opportunity to benefit from his or her close relationships for emotional regulation, which may lead to mental health problems as Mikulincer and Shaver (2008) describe: '"Secondary" (insecure) attachment strategies distort and damage emotion regulation and thereby contribute to psychological and social problems.' (p. 519) These non-optimal attachment strategies also inhibit the individual's ability to form new rewarding relationships. Even when social support is provided, its beneficial potential for mental health is likely to be influenced by a range of factors. It may depend on whether the support provided is adequate in matching the needs dictated by a stressful situation. Social Support and Buffering Theory, for instance, proposes that: 'there must be a reasonable match between the coping requirements and the available support in order for buffering to occur' (p. 314) (Cohen & Wills, 1985). Also, it may depend on how support is provided. Thriving Through Relationships Theory suggests that to have a positive influence, support must be responsive, which means that the amount and type of support provided must be dictated by the situation and the needs of the person receiving the support. Furthermore, it must be provided in a sensitive way, so that the support recipient feels understood, validated, and cared for. Conversely, unresponsive and insensitive support may, even if provided with the best intentions, cause harm (e.g., support that makes the individual feel weak, or like a burden, or support providers that act in neglectful or overcontrolling ways). In these cases, support may act to promote overdependence or under-dependence which may hinder and undermine thriving as Feeney and Collins (2015) explain: "Poor quality SOS support (or lack thereof) can exacerbate stress, prolong recovery, reduce resilience, and hinder growth from adversity. Likewise, poor-quality RC support can thwart goal striving, reduce intrinsic motivation, and hinder the development of new talents and capacities' (p. 122). The positive influence of support may also depend on who is giving and receiving the support. Relational Regulation Theory, for instance, argues that not all social relations are effective in regulating people due to differences in both support providers' and support recipients' personal tastes and preferences as Lakey and Orehek (2011) explain: 'one provider's stoicism and another provider's emotional expressiveness will be effective for different recipients' (p. 486). Receiving and giving support may also come with a cost, as per Cohen and Wills (1985): 'It may be that there are some costs associated with receiving support in particular instances, especially when it is asked for or when the receiver feels obligated to the giver as a result of the transaction (…)' (p. 351).

3.2.3.2. Relationships that lead to positive versus negative affect.

Whether or not relationships are perceived as supportive is likely to depend on these causing positive rather than negative affect. Cohen and Wills (1985), for instance, point to the possibility that network conflict may have negative effects. This is also emphasized in Need to Belong Theory in which Baumeister and Leary (1995) explain: 'In many cases, it is not the mere fact of having an interpersonal attachment, but rather having an attachment that brings positive interactions, that is decisive. Relationships marked by conflictual interactions are much less beneficial and sometimes harmful' (p. 513). According to Need to Belong Theory, whether social relationships promote negative or positive emotions depends on whether they either meet or thwart the individual's need to belong. Relationships that meet this need (i.e., in which the individual feels accepted, included,

and welcomed) tend to lead to positive feelings. Relationships that thwart the need to belong (i.e., in which the individual is rejected by others, excluded, or ignored) may cause negative feelings such as anxiety, grief, depression, and loneliness. These states may in turn be detrimental to mental health. An example of how these mechanisms work is described by Baumeister and Leary (1995) based on Vinokur and Van Ryn (1993): '(…) social undermining (e.g., conflict, criticism, making life difficult, and inducing feelings of being unwanted) in close relationships has a strong negative effect on mental health' (p. 514). According to Need to Belong Theory, for relationships to be rewarding they must be characterized by mutual care. Similarly, Regular Regulation Theory suggests that beneficial interactions are the ones that cause favorable affect and thoughts as Lakey and Orehek (2011) explain: 'Relational support is rooted not only in whether a recipient has similar attitudes to a provider but primary in the context to which talking about these attitudes elicits favorable affect' (p. 488). Some social interactions may, according to the theory, cause less favorable affect, negative thinking, and lower perceived support. Lakey and Orehek (2011) highlight evidence that illustrates the potential negative effect of social influence on low self-esteem, self-discrepancies, worry, and hopelessness.

3.2.3.3. Relationships that one feels connected to versus contacts to strangers.

Another aspect influencing whether social relationships become rewarding to mental health has to do with their type and character. Even though mental health is affected by different types of relationships, the most rewarding relationships may be the ones that the individual feels connected to and perceives as important. Need to Belong Theory, Thriving Through Relationships Theory and the Social Cure approach agree that relationships which people do not feel connected to are less beneficial as exemplified in the following quote: 'many groups that we belong to do not affect our health and well-being for the simple reason that, when we do not identify highly with these groups, group memberships are not internalised as an important part of the self and hence the group in question will have little or no impact on an individual's health' (p. 792) (Jetten et al., 2017). According to the Social Cure approach, individuals must identify themselves with the social group for it to be beneficial. Need to Belong Theory argues that interactions with strangers and new acquaintances that people do not feel connected to have little to offer in providing a sense of belonging and affecting well-being as Baumeister and Leary (1995) explain; '(…) an interaction with a person in the context of an ongoing relationship is subjectively different from and often more rewarding than an interaction with a stranger or casual acquaintance' (p. 500). The theory furthermore suggests that, for optimal benefit, interactions should be frequent. Similar to this, Thriving Through Relationships Theory proposes that support provided by strangers and non-close others is less effective in promoting thriving than support provided by close friends, intimate partners, and parents. Also, Social Support and Buffering Theory points to the possibility that the most effective relationships for a buffering effect are the ones in which an individual is close to the person offering support, as Cohen and Wills (1985) describe: 'Adequate functional support may be derived from one very good relationship, but may not be available to those with multiple superficial relationships' (p. 315).

3.2.3.4. 'Healthy' versus 'unhealthy' relationships.

The circumstances that characterize a social group that a person belongs to and the activities that take place within the group may also influence its beneficial potential. This perspective is suggested by the Social Cure approach: '(…) group memberships can also be a source of stress that is detrimental to health and well-being. This is the case for example, when people belong to stigmatized groups, when groups promote toxic and unhealthy norms, or when people belong to groups that do not provide them with social support. (…) rather than being a "social cure" groups can be a "social curse" (…)' (p. 792) (Jetten et al., 2017). According to this approach, social groups that benefit the individual's well-being and self-esteem are groups that provide them with positive social identities (i.e., groups characterized by high status,

advancement, and success). Contrary to this, a social identity derived from belonging to a group characterized by for instance low status, failure, or stigmatization tends to not hold the same beneficial potential and may cause harm as Jetten et al. (2017) explain: *'When the group that defines a person's social identity is compromised in some way (e.g., by stigma, low status, or failure) the capacity for social identity to function as a beneficial psychological resource is reduced and this will tend to have negative consequences for their health and well-being' (p. 794)*. One explanation for this is that people, when they identify highly with a social group, also become vulnerable to the negative treatment of others (e.g., discrimination, prejudices behavior (Jetten et al., 2017)). Social groups may also exert a harmful influence on well-being if the group promotes unhealthy norms. According to the Social Cure approach, identifying strongly with a social group makes people vulnerable to the social influence of the group. The danger of this is that this may increase their responsiveness and motivation to live out potentially harmful norms promoted by the group such as binge drinking or taking drugs.

3.2.4. How subjective perceptions influence the impact of social relationships on mental health

People's subjective perceptions of the social relationships and the resources they provide are crucial in determining whether they are beneficial to mental health. It may depend on the individual's perception of the social bond. This perspective is evident in Need to Belong Theory and Thriving Through Relationships Theory that agree that the most rewarding relationships are the ones people feel connected to. To fulfill the need for belonging, for example, Baumeister and Leary (1995) explain that people need to perceive that: *'(…) there is an interpersonal bond or relationship marked by stability, affective concern and continuation into the foreseeable future'* and that *'the need is for regular social contact with those to whom one feels connected' (pp. 500,501)*. Need to Belong Theory and Thriving Through Relationships Theory further agree that optimal relationships are those characterized by mutual care. To satisfy the need for belonging, for instance, Need to Belong Theory argues that people must feel that others care about their welfare and like or perhaps love them. The point that the most effective relationships are those the individual feels connected to is similarly evident in the Social Cure approach. According to this theoretical perspective, for social group memberships to unlock the psychological resources necessary to benefit well-being, people must identify with the social group. Another way in which subjective perceptions matter is by determining the effect of social support provided by others. Thriving Through Relationships Theory for instance highlights that the beneficial effect of the two support functions, Relational Catalyst support and Source of Strength support, is mediated by the perception of the support as Feeney and Collins (2015) explain: *'Then, perceptions of partner responsiveness should predict the immediate outcomes (…)' (p. 129)*. In similarity to this, Social Support and Buffering Theory suggest that support must be perceived as adequate in relation to the needs dictated by the situation to buffer stress. The Social Cure approach argues, that sharing the social identity of the group is important for support to be interpreted in a way for the individual to benefit from the support as Jetten et al. (2017): *"(…) a sense of shared identity is a basis for interpreting* support *in the spirit in which it is intended and being in a position to benefit from it" (p. 798)*. Relational Regulation Theory argues that relationships that are perceived as unsupportive are avoided. These relationships are not effective in regulating the individual.

3.2.5. How individual differences influence the impact of social relationships on mental health

Individual differences matter and may mediate the influence of social relationships on mental health. Whether and to what extend social relationships influence mental health positively may for example depend on the individual's social needs. Need to Belong Theory for instance notes that the influence of forming social bonds varies according to whether people are socially deprived or if they already have sufficient social bonds to satisfy the need for belonging, as explained by Baumeister and

Leary (1995): *'People need a few close relationships, and forming additional bonds beyond those few has less and less impact. Having two as opposed to no close relationships may make a world of difference to the person's health and happiness; having eight as opposed to six may have very little consequence.' (p. 520)*. Besides this, people may differ in their willingness and ability to create positive relationships and in their ability to reach out and mobilize effective support when needed. The focal point of Adult Attachment Theory is that differences in attachment security and attachment style, including non-optimal attachment strategies, may impact negatively on a person's attempt to effectively seek support and their attempts to create new rewarding and close relationships. Thriving Through Relationships Theory also highlights attachment security as one of the reasons why people differ in whether or not they seek or provide support, including their reactions to others' behavior as Feeney & Collins explains: *'Not all individuals are willing to show vulnerability in times of stress, pursue life opportunities, and seek support when needed (…). Moreover, pre-existing beliefs, expectations, and norms that individuals bring into their interactions may act as interpretative filters and shape the way they perceive and react to one another's behavior' (p. 135)*. Individuals may benefit differently from support provided by others. Social Support and Buffering Theory suggests that due to differences in groups' and individuals' needs for support, they may benefit differently from support functions and social integration. Finally, Relational Regulation Theory emphasizes the differences in peoples' personal preferences in terms of their preferred levels of affect, action, and thoughts to explain why benefits from social support may vary from person to person, depending on how well these preferences match support providers'.

3.3. Synthesis refinement

In this section, guided by Pound and Campbell's (2015) description of synthesis refinement, theories were examined for further theoretical insights. Two processes of synthesis refinement are presented. Firstly, we revisited the theoretical synthesis to provide an overall picture of the insights gained from the synthesis in relation to the study aim (Fig. 3). Secondly, based on the theories, practical implications for the design of interventions based on social relationships are suggested (Table 3).

Fig. 3 summarizes the process of how social relationships influence mental health based on the theory synthesis. The synthesis shows the potential of different types of social relationships to influence mental health positively (Fig. 3 *Social relationships*). Dyad relationships and social group memberships, close and non-close, that arise within a broader frame of social integration in a community, influence the mental health of individuals in times of adversity and times without. Social relationships may act as a positive force in the face of adversities through two different pathways. Firstly, they may provide support that protects the individual against the potentially harmful consequences of the encounter with these adversities. Second, they may enable individuals to build up resilience (Fig. 3 *Potential benefits in times of adversities*). Furthermore, irrespective of adversities, social relationships may benefit mental health, for instance by allowing people to meet their needs for belongingness and by acting as a safe base, thus enabling and encouraging people to seek and engage in life opportunities for personal growth (Fig. 3 *Potential benefits irrespective of adversities*).

It is, however, not a given that the social relationships and group memberships to which people have access always exert positive influences. Some relationships may pose a threat to mental health, and some may not affect mental health at all (Fig. 3. *Negative, positive, no impact on mental health*). These effects depend partly on the individual in question (Fig. 3 *Individual context*). For instance, it may depend on the individual's social needs or needs for support, on their prerequisites for developing and engaging in supportive relationships and social groups, and for reaching out and receiving support from others when needed. It may also depend on individual taste and preference and whether the relationships that a person has access to match these personal preferences. Effects on mental health also depend on the quality and the

Table 3
Theory-driven goals for interventions based on social relationships to improve mental health.

	To improve mental health, interventions should help people develop relationships that:	Types of relationships to target:	Interventions may aim to:	Designers of interventions based on social relationships should be aware that:
Need to Belong Theory	Meet their needs for belongingness.	Dyadic relationships and group memberships.	Facilitate the formation and maintenance of social bonds, either existing or new social relationships or group memberships.	- Not all types of relationships meet belongingness needs - People differ in their needs for belongingness and benefit differently from developing new relationships - Threats to belongingness, e.g., social rejection and ostracism, may cause harm.
Social Cure approach	Provide social identities and thus unlock beneficial psychological resources.	Group memberships.	Support people in engaging in social groups, either existing social groups or new ones.	- Not all social groups affect mental health. Identifying with the group is a prerequisite - Individuals should perceive the social group as meaningful and relevant. - Even meaningful social groups can cause harm if, for instance, they are unsupportive, promote unhealthy norms, or if the group is stigmatized.
Relational Regulation Theory	Offer optimal regulation of affect, thoughts, and action.	Dyadic relationships.	Build supportive relationships for instance by matching support providers with support recipients, or by making available a wide range of support providers.	- Not all types of social relationships are effective in regulating affect. This depends on the match between the support provider and the support recipient.
Social Support and Buffering Theory	Provide adequate social support and social integration.	Dyadic relationships and network integration.	Build supportive relationships and support integration in social networks.	- Not all types of support are effective in buffering stress. Support must be perceived as adequate and must match the needs elicited by the stressful situation - People have different support needs and may benefit differently from support.
Adult Attachment Theory	Regulate emotions effectively.	Dyadic relationships.	Build supportive attachment relationships.	- People differ in their willingness and ability to form rewarding relationships and in their propensities to seek and give support.
Thriving Through Relationships Theory	Provide social support in times with and without adversities.	Dyadic relationships.	Build close supportive relationships and train support providers to deliver responsive and sensitive support.	- Not all social relationships affect mental health and thriving. Support from close and caring relationships is more effective - Close relationships that offer poor quality support may hinder thriving.

relational content of the relationships and group memberships in question (Fig. 3 *Relational context*). Together, the theories suggest that the beneficial effect of social relationships vary according to 1) whether relationships are supportive or unsupportive, 2) whether they cause positive rather than negative affect, 3) whether they are with someone the individual feels connected to versus, for instance, connections to strangers, and 4) whether relationships are 'healthy' rather than 'unhealthy'. Ultimately the effect of social relationships on mental health depends on how people subjectively perceive the relationships and what they may or may not be offering (Fig. 3 *Perceptions)*.

For the benefit of designing interventions that aim to improve mental health and avoid causing harm, Table 3 presents an overview of the six included theories and suggests theory-driven goals for interventions based on social relationships to improve mental health.

4. Discussion

In this study, six principal theories linking social relationships to mental health were synthesized to explain 1) how social relationships influence mental health and 2) the circumstances that distinguish beneficial social relationships from relationships that have no effects or cause harm. From the process of weaving the theories together, we have provided an overall theoretical roadmap explaining the possible pathways by which social relationships influence mental health (Fig. 3). The central finding is that various social relationships join together through life to influence people's mental health as they confront adverse circumstances and without adversities. The beneficial potential of social relationships is, however, shaped by a complex interplay of individual

and relational circumstances and ultimately, by the subjective perceptions of the individual. While some relationships therefore may benefit people, others may pose a threat to mental health or have no effects.

Based on the results, we argue that interventions based on social relationships, hold the potential to strengthen positive mental health (i.e., subjective well-being and affective balance, the development of abilities to manage life, maximize one's potential, participate in, and contribute to society (Barry et al., 2019)). In this conclusion, we agree with other researchers who have similarly argued for the relevance of interventions based on social relationships and group memberships to improve mental health (Saeri et al., 2018; Umberson & Karas Montez, 2010). We believe the potential of interventions based on social relationships to be applicable across population groups. Mental health promotion has relevance for all (Barry et al., 2019), and both healthy populations and populations dealing with mental health problems may benefit from interventions based on social relationships for improvement of their subjective well-being and abilities to manage life. From reviewing and integrating theories, the synthesis strengthens the accessibility of six middle-range theories for practical application for such interventions. We draw on the theories, separately, to suggest theory-driven goals for the design of interventions based on social relationships (Table 3). The synthesis, however, also extends beyond the perspectives provided by each theory individually by pointing to theoretical points on which the theories agree, thus providing a solid foundation to inform future intervention design and development (Fig. 3).

Our synthesis has highlighted that a person's mental health is influenced by many different relationships, ranging from the most significant and close ones that they may have with their parents, partners, and close

friends, to those in the wider social groups and the communities to which they belong. From a socioecological perspective, based on the model of 'layers of influence' provided by Dahlgren and Whitehead (1991), mental health can be perceived as being influenced by relationships in different 'layers' extending from the individual in the center, with each layer interacting with another. This conclusion also finds support in the work of Kawachi and Berkman (2001) and Lin, Ye, and Ensel (1999) and shares many similarities to the Convoy Model described by Antonucci and colleagues (Antonucci, Birditt, & Ajrouch, 2011). Based on this, we argue that community interventions aiming to promote mental health may benefit from a multilevel approach to support beneficial social relationships on several different layers.

In particular, the quality and content of social relationships are essential to separating beneficial relationships from relationships of minor importance and relationships that cause harm. The synthesis points to different aspects that should be taken into account to make sure that interventions achieve their desired effects, including whether the facilitated relationships 1) are supportive versus unsupportive 2) cause positive rather than negative affect 3) are with someone the individual feels connected to versus, for instance, connections to strangers, 4) are 'healthy' versus 'unhealthy' relationships. In line with other research (Umberson & Karas Montez, 2010), we argue that designing interventions to support the quality (rather than just quantity) of social relationships is crucial to their potential to promote mental health.

4.1. Digital interventions to support social relationships and mental health

Our findings are broadly relevant for intervention developers across different areas, target groups, and methods. However, since technology-based solutions have become popular tools to support social relationships (Barbosa Neves, Franz, Judges, Beermann, & Baecker, 2019; Wister, Fyffe, & O'Dea, 2021), in this, and the following sections, they serve as an example of how results from the theoretical synthesis may be applied in practice to both seize opportunities and manage risk, thus assisting in the development of interventions within this emerging field.

4.2. Theoretically informed potential of digital technologies to support relationships and mental health

On the positive side, digital technologies have the potential to provide people with opportunities to access and develop new social relationships and/or to maintain and strengthen existing ties (Grieve, Indian, Witteveen, AnneTolan, & Marrington, 2013; Ryan, Allen, Gray, & McInerney, 2017). For instance, they may provide people with opportunities to form and join groups and communities (Allen, Ryan, Gray, McInerney, & Waters, 2014), and enable them to communicate with a variety of people, including families, friends, and social groups of interest asynchronously and across geographical distances (Barbosa Neves et al., 2019). Thus, the use of digital interventions offers opportunities to support several different relationships, both existing and new. Theoretically, increasing people's opportunities to form or maintain social relationships with the use of digital technologies could positively influence their mental health by increasing their opportunities to meet their needs for belongingness (Need to Belong Theory); gain access to social support (Social Support and Buffering Theory, Thriving Through Relationships Theory); join and engage in social groups and communities (Social Cure approach), and interact with others for emotional regulation (Relational Regulation Theory, Adult Attachment Theory). Only one of the included theories, Relational Regulation Theory, speaks to the positive potential of the internet to increase the availability of social relationships and argues for the potential of this to increase people's abilities to locate a match for effective regulation of affect (Lakey & Orehek, 2011).

4.3. Evidence on the potential of digital technologies to support social relationships and mental health

Empirical studies point to the potential for digital interventions to support social relationships and mental health. Notably, during COVID-19 and the resulting social isolation, digital communication technologies have proven to be essential tools to maintain social interaction, with the potential to reduce loneliness and improve belongingness (Gallucci et al., 2020). Similar findings have been seen in other contexts. Among older adults with reduced mobility, Ibarra et al. (2020) found in their systematic review that technology-supported interventions allowed people to expand their social networks, strengthen existing ties, and provide social support. Furthermore, in terms of supporting mental health and well-being, empirical studies investigating the use of different types of technology to support social relationships among older adults indicate that these tools have positive potentials (Isaacson, Cohen, & Shpigelman, 2019; Morton et al., 2018). However, further research into their effectiveness is needed (Ibarra et al., 2020; Shah, Nogueras, van Woerden, & Kiparoglou, 2020a). In the Danish context, a web-based platform enabling citizens to identify and make contact with others forms part of the health-promoting strategies of a wide range of municipalities and has been found to support belonging and mental health under certain conditions (Andersen, Reavley, Bøggild, & Overgaard, 2020).

4.4. Theory-driven issues to be aware of for the design of digital interventions to support social relationships and mental health

An essential issue of relevance to developers of digital interventions is to ensure high-quality relationships, as these are central to success in improving mental health. Exemplifying this, Barbosa Neves et al. (2019) found that the positive consequences of introducing a communication app to older adults in residential care to enhance social connectedness depended on the quality of the relationships. Related to the prospects of supporting high-quality relationships and interactions with digital interventions, research on commercial social media points to important challenges and risk factors that intervention developers will need to address to ensure that digital interventions achieve their desired effects. Firstly, even though this has been debated, some research suggests that online relationships may be less beneficial than offline relationships in providing support that benefits mental health (Trepte, Dienlin, & Reinecke, 2015; Utz & Breuer, 2017) and to satisfy needs for belongingness (Sacco & Ismail, 2014). Secondly, online interaction holds potential social risks that may harm mental health, including the risk of online ostracism and social isolation (Allen et al., 2014; Tobin, Vanman, Verreynne, & Saeri, 2015), cyberbullying (Viner et al., 2019), and the risk of people joining extreme communities such as pro-anorexia groups or pro-suicide groups (Bell, 2007; Hayes, Maughan, & Grant-Peterkin, 2016). Thirdly, it has been suggested that the use of online tools may prevent people from benefitting from their 'offline' relationships and increase loneliness to the extent that time spent in face-to-face interactions are displaced by online activities (Ahn & Shin, 2013; Nowland, Necka, & Cacioppo, 2018; Ryan et al., 2017).

As with other social relationships, opportunities to develop and maintain beneficial social relationships to improve mental health in a digital context may also depend on individual differences. For example, studies on commercial social media suggest that whether people benefit from this technology depends on whether they use it to form new meaningful relationships and/or to strengthen existing ties (Clark, Algoe, & Green, 2018; Nowland et al., 2018). This may depend for instance on their loneliness status. Nowland et al. (2018) suggest that lonely people may be disadvantaged and therefore may need support in using social media to enhance existing friendships and/or form new relationships. In

support of this, results from a realist evaluation of a digital platform used in community care to promote belonging and mental health showed that people with previous relational difficulties and histories of struggling for belonging may need support to benefit from the social opportunities provided by the technology (Andersen et al., 2020). Especially when digital interventions are based on enabling individuals to access their existing network, individual differences, in terms of whether people have a network available for meaningful interaction is also crucial (Barbosa Neves et al., 2021).

4.5. Use of middle-range theories to inform interventions

Theorizing interventions has been recommended as a crucial aspect in intervention development, with the potential to lead to increased effectiveness (Bonell et al., 2013). Middle-range theories play an important role in this as they may, along with empirical and practice-based evidence, contribute to the knowledge base informing how an intervention works, and under what circumstances it can be expected to lead to certain outcomes; the so-called programme theory (Skivington et al., 2021). However, as Moore and Evans (2017) highlight, there are several pitfalls to the application of theories in interventions that challenge the idea that interventions based on explicit theory are always superior to interventions that are not. First, the theories that inform an intervention may be inappropriate and thus may not address the mechanisms underlying the problem that the intervention is trying to address. Second, the dominance of the use of individual-level behavioral theory may distract attention away from important structural contributors to problems. Third, theories used without incorporating consideration of the broader context (e.g., time and place) may also fail. The theory synthesis performed in this study sought specifically to increase the accessibility of theories and thus to address the risk of using a popular "of-the-shelf-theory" that does not adequately address the mechanisms underlying a problem. The theories identified were primarily interpersonal level theories integrating social and psychological dimensions of mental health. Intervention developers should be aware that interventions may also benefit from incorporating societal-level theories for instance sociological theories on the influence of social capital on buffering or generating socioeconomic inequalities in health (e.g., Bourdieu, 2018; Coleman, 1994). Considering the context, it also needs to be emphasized that none of the included theories had been developed to explain how social relationships act to influence mental health in an online environment or with the use of digital technologies. We believe that our consideration of the implications for digital interventions does make a significant contribution to informing underlying theories on how these technologies may or may not work to support social relationships and mental health. However, future research on middle-range theories emerging from the digital research field is needed to understand how mechanisms operate to promote social relationships and mental health in this context. Furthermore, since all the included theories were developed in high-income western societies, care must be taken in transferring the conclusions directly to other cultures and societies, with a thorough consideration of the context likely to be essential for successful adaptation.

4.6. Strengths and limitations

In this study, we used systematic search procedures to identify theories which allowed us to increase the transparency of the search process and to strengthen the study's reliability (Campbell et al., 2014). Previous studies have pointed to the potential value of appraising the quality of theories as part of a systematic approach to identifying theories (Campbell et al., 2014; Pound & Campbell, 2015). We used the formal definition of theory provided by Sutton and Staw (1995) and Merton (1967) and further emphasized that the included theories lived up to the requirements of testability and generalizability. The inclusion of a wide range of conceptualizations of social relationships enabled us to draw

from different research traditions to identify and capture the complexity of the various aspects of social relationships theorized to have a positive influence on mental health (e.g., belongingness, social support, attachment, etc.). It is our assessment that the systematic approach to the search for theories has led to the identification of some of the most central, as well as lesser-used theories. The five electronic databases in which the search was conducted were carefully chosen based on guidance from an experienced university information specialist, to represent databases in which theories within the selected field were most likely to be identified. While our search was conducted in July 2018, we consider it unlikely that alternative theories have emerged since then. Theory development is a process that may extend over several years and as the field is not developing at the same rapid pace as empirical research, we assume that further theory development will be limited. This theoretical review however also has important limitations. We did not supplement our systematic search for theories with citation chasing to identify further theories and nor did we include empirical material that mentioned or used theory as a framework for interpretation as entry points for identification of further theories. This may have narrowed the number of identified theories. The Convoy Model of social relations (Antonucci et al., 2011) is a concrete example of a theoretical model that was not identified by the systematic search and therefore was not included in this synthesis. To further inform interventions to support social relationships and mental health, a review and synthesis on theories of change underpinning the main types of interventions to influence social relationships would be valuable.

5. Conclusions

This synthesis highlights the importance of friendships, family relationships, social groups, and communities for a person's mental health and therefore supports the potential of interventions based on social relationships and group memberships to promote public mental health. It also highlights the great complexity of the processes by which social relationships contribute both positively and negatively to mental health. It is important that intervention developers consider the circumstances in which social relationships might do more harm than good. We argue that separately or in combination, the theories that have been identified and synthesized in this study may inform such considerations and thereby lead to the development of more effective interventions. Digital interventions are modern tools that, on the one hand, offer the potential to increase people's opportunities to maintain or strengthen existing social ties. On the other hand, they present new challenges in terms of supporting the quality and content that characterizes beneficial social relationships. Providing people with, or training them to use, digital communication technologies is no guarantee that relationships with a positive influence on mental health will emerge. To maximize this potential benefit, a special focus on ensuring the quality and content of relationships is needed. By developing digital interventions based on formal theories linking social relationships to mental health, potential challenges may be better addressed and lead to a higher chance of interventions to succeed in supporting mental health.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssmmh.2021.100042.

References

Ahn, D., & Shin, D. (2013). Is the social use of media for seeking connectedness or for avoiding social isolation? Mechanisms underlying media use and subjective well-being. *Computers in Human Behavior, 29*(6), 2453–2462. https://doi.org/10.1016/j.chb.2012.12.022

Allen, K. A., Ryan, T., Gray, D. L., McInerney, D. M., & Waters, L. (2014). Social media use and social connectedness in adolescents: The positives and the potential pitfalls. *Australian Educational and Developmental Psychologist, 31*(1), 18–31. https://doi.org/10.1017/edp.2014.2

Andersen, L. M. B., Reavley, N. J., Bøggild, H., & Overgaard, C. (2020). The role of social technologies in community care - a realist evaluation of a Danish web-based citizen-to-citizen platform adopted in community care to promote belonging and mental health. *Health and Social Care in the Community.* https://doi.org/10.1111/hsc.13222

Antonucci, T. C., Birditt, K. S., & Ajrouch, K. (2011). Convoys of social relations: Past, present, and future. In K. L. Fingerman, C. A. Berg, J. Smith, & T. C. Antonucci (Eds.), *Handbook of life-span development* (pp. 161–182). Springer Publishing Company.

Barbosa Neves, B., Franz, R., Judges, R., Beermann, C., & Baecker, R. (2019). Can digital technology enhance social connectedness among older adults? A feasibility study. *Journal of Applied Gerontology, 38*(1), 49–72. https://doi.org/10.1177/0733464817741369

Barbosa Neves, B., Waycott, J., & Maddox, A. (2021). When technologies are not enough: The challenges of digital interventions to address loneliness in later life. *Sociological Research Online.* https://doi.org/10.1177/13607804211029298, 13607804211029298.

Barry, M. M., Clarke, A. M., Petersen, I., & Jenkins, R. (2019). In *Implementing mental health promotion* (2nd ed.). Cham: Springer. https://doi.org/10.1007/978-3-030-23455-3.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497–529. https://doi.org/10.1037/0033-2909.117.3.497

Bell, V. (2007). Online information, extreme communities and internet therapy: Is the internet good for our mental health? *Journal of Mental Health, 16*(4), 445–457. https://doi.org/10.1080/09638230701482378

Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine, 51*(6), 843–857. https://doi.org/10.1016/S0277-9536(00)00065-4

Bonell, C., Fletcher, A., Jamal, F., Wells, H., Harden, A., Murphy, S., et al. (2013). Theories of how the school environment impacts on student health: Systematic review and synthesis. *Health & Place, 24*, 242–249. https://doi.org/10.1016/j.healthplace.2013.09.014

Booth, A., & Carroll, C. (2015). Systematic searching for theory to inform systematic reviews: Is it feasible? Is it desirable? *Health Information and Libraries Journal, 32*(3), 220–235. https://doi.org/10.1111/hir.12108

Bourdieu, P. (2018). *The forms of capital.* Routledge.

Bowlby, J. (1969). *Attachment and loss, 1.* New York: Basic books.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Cacioppo, J. T., & Cacioppo, S. (2014). Social relationships and health: The toxic effects of perceived social isolation. *Social and Personality Psychology Compass, 8*(2), 58–72. https://doi.org/10.1111/spc3.12087

Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection.* WW Norton & Company.

Campbell, M., Egan, M., Lorenc, T., Bond, L., Popham, F., Fenton, C., et al. (2014). Considering methodological options for reviews of theory: Illustrated by a review of theories linking income and health. *Systematic Reviews, 3*(1), 114. https://doi.org/10.1186/2046-4053-3-114

Clark, J. L., Algoe, S. B., & Green, M. C. (2018). Social network sites and well-being: The role of social connection. *Current Directions in Psychological Science, 27*(1), 32–37. https://doi.org/10.1177/0963721417730833

Cohen, S. (2004). Social relationships and health. *American Psychologist, 59*(8), 676–684. https://doi.org/10.1037/0003-066X.59.8.676

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Coleman, J. S. (1994). *Foundations of social theory.* Harvard university press.

Dahlgren, G., & Whitehead, M. (1991). *Policies and strategies to promote social equity in health. background document to WHO - strategy paper for Europe. (No. 2007:14).* Stockholm: Institute for Futures Studies.

Durkheim, E. (2002). In *Suicide A study in sociology* (2nd ed.). Hoboken: Taylor and Francis.

Feeney, B. C., & Collins, N. L. (2015). A new look at social support: A theoretical perspective on thriving through relationships. *Personality and Social Psychology Review, 19*(2), 113–147. https://doi.org/10.1177/1088868314544222

Gallucci, M., Baldissarri, C., Gabbiadini, A., Durante, F., De Rosa, M., & Valtorta, R. R. (2020). Together apart: The mitigating role of digital communication technologies on negative affect during the COVID-19 outbreak in Italy. *Frontiers in Psychology, 11*, 554678. https://doi.org/10.3389/fpsyg.2020.554678

Grieve, R., Indian, M., Witteveen, K., Anne Tolan, G., & Marrington, J. (2013). Face-to-face or facebook: Can social connectedness be derived online? *Computers in Human Behavior, 29*(3), 604–609. https://doi.org/10.1016/j.chb.2012.11.017

Harrison, H., Griffin, S. J., Kuhn, I., & Usher-Smith, J. A. (2020). Software tools to support title and abstract screening for systematic reviews in healthcare: An evaluation. *BMC Medical Research Methodology, 20*(1), 7. https://doi.org/10.1186/s12874-020-0897-3

Haslam, C., Cruwys, T., Haslam, S. A., Dingle, G., & Chang, M. X. L. (2016). Groups 4 health: Evidence that a social-identity intervention that builds and strengthens social group membership improves mental health. *Journal of Affective Disorders, 194*, 188–195. https://doi.org/10.1016/j.jad.2016.01.010

Haslam, C., Jetten, J., & Haslam, S. A. (2012). Advancing the social cure: Implications for theory, practice and policy. In C. H. Jetten, & S. A. Haslam (Eds.), *Advancing the social cure: Implications for theory, practice and policy* (pp. 319–343). New York, NY, US: Psychology Press.

Hawkley, L. C., & Cacioppo, J. T. (2013). Social connectedness and health. In C. Hazan, & M. I. Campa (Eds.), *Human bonding: The science of affectional ties* (pp. 343–364). New York, NY, US: Guilford Press.

Hayes, J. F., Maughan, D. L., & Grant-Peterkin, H. (2016). Interconnected or disconnected? Promotion of mental health and prevention of mental disorder in the digital age. *British Journal of Psychiatry, 208*(3), 205–207. https://doi.org/10.1192/bjp.bp.114.161067

Herrman, H., Saxena, S., & Moodie, R. (2004). *Promoting mental health: Concepts, emerging evidence, practice: Summary report.* Geneva: World Health Organization.

Holt-Lunstad, J., & Smith, T. B. (2012). Social relationships and mortality. *Social and Personality Psychology Compass, 6*(1), 41–53. https://doi.org/10.1111/j.1751-9004.2011.00406.x

Ibarra, F., Baez, M., Cernuzzi, L., & Casati, F. (2020). A systematic review on technology-supported interventions to improve old-age social wellbeing: Loneliness, social isolation, and connectedness. *Journal of Healthcare Engineering, 1*–14. https://doi.org/10.1155/2020/2036842, 2020.

Isaacson, M., Cohen, I., & Shpigelman, C. N. (2019). Leveraging emotional wellbeing and social engagement of the oldest old by using advanced communication technologies: A pilot study using uniper-care's technology. In *Paper presented at the 3rd IET International Conference on technologies for active and assisted living (TechAAL 2019).* https://doi.org/10.1049/cp.2019.0102

Jetten, J., Haslam, S. A., Cruwys, T., Greenaway, K. H., Haslam, C., & Steffens, N. K. (2017). Advancing the social identity approach to health and well-being: Progressing the social cure research agenda. *European Journal of Social Psychology, 47*(7), 789–802. https://doi.org/10.1002/ejsp.2333

Kawachi, I., & Berkman, L. (2001). Social ties and mental health. *Journal of Urban Health, 78*(3), 458–467. https://doi.org/10.1093/jurban/78.3.458

Khosravi, P., Rezvani, A., & Wiewiora, A. (2016). The impact of technology on older adults' social isolation. *Computers in Human Behavior, 63*, 594–603. https://doi.org/10.1016/j.chb.2016.05.092

Lakey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological Review, 118*(3), 482–495. https://doi.org/10.1037/a0023477

Lincoln, K. D. (2000). Social support, negative social interactions, and psychological well-being. *Social Service Review, 74*(2), 231–252. https://doi.org/10.1086/514478

Lin, N., Ye, X., & Ensel, W. M. (1999). Social support and depressed mood: A structural analysis. *Journal of Health and Social Behavior, 40*(4), 344–359. https://doi.org/10.2307/2676330

Lorenc, T., Clayton, S., Neary, D., Whitehead, M., Petticrew, M., Thomson, H., … Renton, A. (2012). Crime, fear of crime, environment, and mental health and wellbeing: Mapping review of theories and causal pathways. *Health & Place, 18*(4), 757–765. https://doi.org/10.1016/j.healthplace.2012.04.001

Merton, R. K. (1936). The unanticipated consequences of purposive social action. *American Sociological Review, 1*(6), 894–904. https://doi.org/10.2307/2084615

Merton, R. K. (1967). On sociological theories of the middle range. *Classical Sociological Theory,* 39–72.

Mikulincer, M., & Shaver, P. R. (2008). Adult attachment and affect regulation. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed. ed., pp. 503–531). New York: The Fuilford Press.

Moore, G. F., & Evans, R. E. (2017). What theory, for whom and in which context? Reflections on the application of theory in the development and evaluation of complex population health interventions. *SSM - Population Health, 3*(C), 132–135. https://doi.org/10.1016/j.ssmph.2016.12.005

Morton, T. A., Wilson, N., Haslam, C., Birney, M., Kingston, R., & McCloskey, L. (2018). Activating and guiding the engagement of seniors with online social networking: Experimental findings from the AGES 2.0 project. *Journal of Aging and Health, 30*(1), 27–51. https://doi.org/10.1177/0898264316664440

Nowland, R., Necka, E. A., & Cacioppo, J. T. (2018). Loneliness and social internet use: Pathways to reconnection in a digital world? *Perspectives on Psychological Science: A Journal of the Association for Psychological Science, 13*(1), 70–87. https://doi.org/10.1177/1745691617713052

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Pound, P., & Campbell, R. (2015). Exploring the feasibility of theory synthesis: A worked example in the field of health related risk-taking. *Social Science & Medicine, 124*, 57–65. https://doi.org/10.1016/j.socscimed.2014.11.029

Rook, K. S. (1984). The negative side of social interaction: Impact on psychological well-being. *Journal of Personality and Social Psychology, 46*(5), 1097–1108. https://doi.org/10.1037/0022-3514.46.5.1097

Ryan, T., Allen, K. A., Gray, D. L., & McInerney, D. M. (2017). How social are social media? A review of online social behaviour and connectedness. *Journal of Relationships Research, 8*. https://doi.org/10.1017/jrr.2017.13

Sacco, D. F., & Ismail, M. M. (2014). Social belongingness satisfaction as a function of interaction medium: Face-to-face interactions facilitate greater social belonging and interaction enjoyment compared to instant messaging. *Computers in Human Behavior, 36*, 359–364. https://doi.org/10.1016/j.chb.2014.04.004

Saeri, A. K., Cruwys, T., Barlow, F. K., Stronge, S., & Sibley, C. G. (2018). Social connectedness improves public mental health: Investigating bidirectional relationships in the New Zealand attitudes and values survey. *Australian and New Zealand Journal of Psychiatry, 52*(4), 365–374. https://doi.org/10.1177/0004867417723990

Sani, F. (2012). Group identification, social relationships, and health. In J. Jetten, C. Haslam, & S. A. Haslam (Eds.), *The social cure: Identity, health and well-being* (pp. 21–37). New York, US: Psychology Press.

Shah, S. G. S., Nogueras, D., van Woerden, H. C., & Kiparoglou, V. (2020a). Are digital technology interventions effective to reduce loneliness in older adults? A systematic review and meta-analysis. *medRxiv*. https://doi.org/10.1101/2020.08.27.20183012

Shah, S. G. S., Nogueras, D., van Woerden, H. C., & Kiparoglou, V. (2020b). The COVID-19 pandemic: A pandemic of lockdown loneliness and the role of digital technology. *Journal of Medical Internet Research, 22*(11), Article e22287. https://doi.org/10.2196/22287

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., … Moore, L. (2021). A new framework for developing and evaluating complex interventions: Update of medical research council guidance. *BMJ, 374*, n2061. https://doi.org/10.1136/bmj.n2061

Sutton, R. I., & Staw, B. M. (1995). What theory is not. *Administrative Science Quarterly, 40*(3), 371–384. https://doi.org/10.2307/2393788

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey: CA: Books/Cole.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior, 52*(2), 145–161. https://doi.org/10.1177/0022146510395592

Tobin, S. J., Vanman, E. J., Verreynne, M., & Saeri, A. K. (2015). Threats to belonging on facebook: Lurking and ostracism. *Social Influence, 10*(1), 31–42. https://doi.org/10.1080/15534510.2014.893924

Trepte, S., Dienlin, T., & Reinecke, L. (2015). Influence of social support received in online and offline contexts on satisfaction with social support and satisfaction with life: A longitudinal study. *Media Psychology, 18*(1), 74–105. https://doi.org/10.1080/15213269.2013.838904

Uchino, B. N., Bowen, K., Carlisle, M., & Birmingham, W. (2012). Psychological pathways linking social support to health outcomes: A visit with the "ghosts" of research past, present, and future. *Social Science & Medicine, 74*(7), 949–957. https://doi.org/10.1016/j.socscimed.2011.11.023, 1982.

Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior, 51*, S54–S66. https://doi.org/10.1177/0022146510383501

Utz, S., & Breuer, J. (2017). The relationship between use of social network sites, online social support, and well-being. *Journal of Media Psychology, 29*(3), 115–125. https://doi.org/10.1027/1864-1105/a000222

Van Ryn, M., & Heaney, C. A. (1992). What's the use of theory? *Health Education Quarterly, 19*(3), 315–330. https://doi.org/10.1177/109019819201900304

Villalonga-Olives, E., & Kawachi, I. (2017). The dark side of social capital: A systematic review of the negative health effects of social capital. *Social Science & Medicine, 194*, 105–127. https://doi.org/10.1016/j.socscimed.2017.10.020, 1982.

Viner, R. M., Aswathikutty-Gireesh, A., Stiglic, N., Hudson, L. D., Goddings, A. L., Ward, J. L., et al. (2019). Roles of cyberbullying, sleep, and physical activity in mediating the effects of social media use on mental health and wellbeing among young people in england: A secondary analysis of longitudinal data. *The Lancet.Child & Adolescent Health, 3*(10), 685–696. S2352-4642(19)30186-5 [pii].

Vinokur, A. D., & Van Ryn, M. (1993). Social support and undermining in close relationships : Their independent effects on the mental health of unemployed persons. *Journal of Personality and Social Psychology, 65*(2), 350–359. https://doi.org/10.1037/0022-3514.65.2.350

Whitehead, M., Pennington, A., Orton, L., Nayak, S., Petticrew, M., Sowden, A., et al. (2016). How could differences in 'control over destiny' lead to socio-economic inequalities in health? A synthesis of theories and pathways in the living environment. *Health & Place, 39*, 51–61. https://doi.org/10.1016/j.healthplace.2016.02.002

Wister, A., Fyffe, I., & O'Dea, E. (2021). Technological interventions for loneliness and social isolation among older adults: A scoping review protocol. *Systematic Reviews, 10*(1), 1–217. https://doi.org/10.1186/s13643-021-01775-6