CASCH
Canadian Alliance for Social Connection and Health

GENWELL PROJECT
Human Connection Movement

Evidence Brief

How can we promote social health?

Background

Feelings of loneliness and social isolation are widespread, with one-in-two adults reporting regular feelings of loneliness (OSG, 2023). Furthermore, chronic loneliness has been strongly linked with an increased risk of chronic disease and premature death (Holt-Lunstad et al., 2015; Park et al., 2020; Rico-Uribe et al., 2018). These realities highlight the need for population-level interventions to address loneliness and prevent the detrimental health outcomes caused by loneliness and social isolation. However, it is unclear whether such interventions are feasible or efficacious and if so, what the most promising pathways to intervention might be.

Purpose

The purpose of this evidence brief is to provide insight into whether population-level health promotion strategies might help address loneliness and social isolation. We define health promotion as efforts to encourage healthy behaviours and lifestyles by "*enabling people to increase control over"* their health (Sharma, 2022; WHO, 1986). In doing so, we consider health promotion to be a comprehensive, multidisciplinary approach encompassing a range of functions that work at the individual, environmental, social, and political levels to modify and facilitate healthy behaviour (Van Den Broucke, 2014; WHO, 1986). To do so, health promotion strategies often employ the use of behaviour change interventions, which are coordinated sets of activities designed to instigate behaviour change (Michie et al., 2011). Behaviour change interventions recognize that many health outcomes are linked to modifiable behaviours and lifestyles, such as smoking, physical activity, diet, and alcohol use, and therefore changing harmful health behaviours could improve health outcomes (Armstrong, 2009; Short & Mollborn, 2015). Indeed, behaviour change interventions have been used to reduce smoking (Black et al., 2020; Roberts et al., 2013), increase vaccine uptake (Habersaat & Jackson, 2020), and increase levels of physical activity (Howlett et al., 2019). However, we recognize that in recent years, the improper use of behaviour change strategies has led to criticism and raised questions about their utility in health promotion (Baum & Fisher, 2014). Indeed, too often, health promotion is reduced to narrow strategies that over-rely on individual-level behaviour change and ignore interpersonal, social, and cultural influences on behaviour (Baum & Fisher, 2014; Laverack, 2017; Van Den Broucke, 2014). Such strategies have been accused of blaming individuals for their unhealthy lifestyles instead of acknowledging the external conditions, such as poverty, that make healthy lifestyles difficult (Bruce et al., 2019; Van Den Broucke, 2014). Additionally, behaviour change techniques are often not appropriately chosen, applied, or adequately linked to underlying theory, limiting their effectiveness and ability to be evaluated or replicated (Carey et al., 2019; Michie et al., 2008; Pinho & Sampaio, 2022). Conscious of these realities, we recognize that individual-level approaches may have limited potential for success, and therefore specifically focus on the efficacy of multi-component, multi-level, comprehensive approaches to health promotion for addressing loneliness.

Evidence from Existing Studies

What is the Nature and Cause of Loneliness?

To understand whether population-level health promotion efforts might help address loneliness and social isolation, it is first important to understand the causes and nature of loneliness. According to Cacioppo's (2018) evolutionary theory of loneliness and Matthews & Tye's (2019) social homeostasis model of loneliness, loneliness arises from deficiencies in one's relationships and connections to others. While individuals vary with respect to how much social connection they need (Bales et al., 2023), humans are nevertheless "social creatures" and our social connections are critical to successful functioning (Snyder-Mackler et al., 2020; Alexander, 1974; Ebstein et al., 2010). However, human social behaviour has changed due to contemporary factors, resulting in increasing social disconnection (Keyes, 1973; Killeen, 1998; Olds & Schwartz, 2009; Putnam, 1995; Putnam, 2000; Sadler, 1978). Indeed, according to a recent advisory from the U.S. Surgeon General, we spend more time alone, less time with family and friends, and have smaller social circles than we did two decades ago (OSG, 2023).

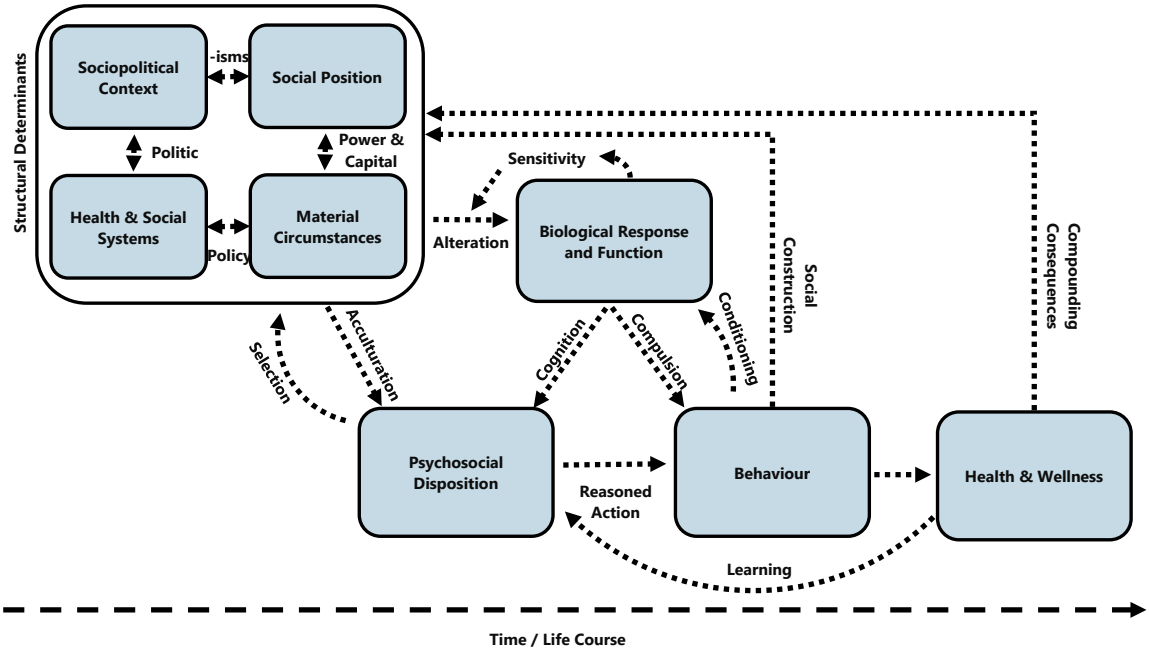
When considered in the context of the theories of loneliness described above, our increasing social disconnection is likely a major cause of loneliness. Thus, improving social connections is theoretically important for preventing and treating loneliness and its associated outcomes (Masi et al., 2011). However, as described by these models, loneliness is a stress-related process (Lee et al., 2021) and chronic exposure to isolation-induced stress is hypothesized to cause a dysregulation of the social-biological response by changing a person's "set point" of social tolerance (i.e., their ideal level of social utility) and leading lonely individuals to become hypervigilant to social threats (Meng et al., 2020; Qualter et al, 2013). Lonely individuals are thus more socially anxious and likely to negatively interpret their social encounters (Cacioppo & Hawkley, 2009). As a result, they tend to reduce their exposure to other people, inducing a negative feedback cycle and further isolating themselves. These processes make treating loneliness exceptionally difficult and highlight the importance of addressing loneliness before it becomes chronic and severe (Mann et al., 2017; Dunn & Lok, 2022).

Can Health Promotion Be Used to Address Loneliness?

As highlighted above, preventing social isolation may be key to preventing the development of chronic and severe loneliness. Thus, promoting social connection may be an essential population health strategy. The question, then, is whether social connection can be influenced through health promotion and behaviour change efforts (Dunn & Lok, 2022). On this question, evidence from other health areas suggests that, when properly implemented, health promotion initiatives rooted in holistic, integrated behaviour change strategies can result in long-term, widespread lifestyle changes among populations (Fischer et al., 2016; Tang et al., 2003; Kumar & Preetha, 2012; Raphael, 2000; Titler 2008). For example, multi-level, multi-component health promotion interventions employed at the individual, community, and socio-political levels have been effective at reducing smoking and preventing its uptake (Golechha, 2016; Minian et al., 2020; Ng et al., 2014). Multi-level, theory-based behaviour change health promotion efforts have been successful at raising public awareness of the necessity of physical activity for a healthy life and have led to increased physical activity among key populations (Gourlan et al., 2016; Heath et al., 2012). In a final example, mandating the use of seatbelts through laws and legislation in combination with mass-media campaigns has been key to increasing seatbelt use

and preventing thousands of automobile-related deaths and injuries each year (Akbari et al., 2021; Baldwin & Houry, 2015; Cohen & Einav, 2003; Kahane, 2015).

In the examples above, the multi-level nature of interventions is considered key to their effectiveness (Akbari et al., 2021; Coates et al., 2008; Cohen & Einav, 2003; Golechha, 2016; Heath et al., 2012; Minian et al., 2020). Multi-level responses are necessary because social health and social behavior are the byproduct of complex structural, biological, and psychological factors (Gilbert, 1993). Indeed, as depicted in the diagram below. Individuals are shaped by their social, cultural, and structural environments through processes of acculturation and even direct alteration of their biology (Ridgeway, 2006; Pandey, 2022). Feedback loops on each of these processes lead to the selection of environments and exposures and changes in environmental sensitivity which further predispose individuals towards certain patterns of behavior (Nesse, 2016). We learn from others and our own actions, which also reinforce the underlying psychological and biological factors that drive our behavior (Thornton & Brock, 2011; Coussi-Korbel, 1995). Moreover, as we enact social behaviours – the affect and impacts of these again compound and reconstruct the same social forces (Gunderson, 2020).



*Note: The figure above presents a "Biopsychosocial Model of Behaviour developed by Dr. Kiffer Card, and demonstrates the complex pathways by which behavior is reinforced and reinforces particular expressions or actions of behavior. See **Appendix 3** for further description of this model.*

These diverse mechanisms and the complex feedback loops they create are why interventions must target multiple paths across both the individual, interpersonal, and structural levels.

What Strategies Are Being Used to Address Loneliness?

A wide range of population health and clinical interventions across various levels have been proposed as strategies for addressing loneliness. Below we discuss intervention components at each level and consider their applications in addressing loneliness and social isolation.

Individual-Level Health Promotion. Individual-level behaviour change strategies include interventions that aim to change individual cognitive and behavioural patterns (Arlinghaus & Johnston, 2018; Hobbis & Sutton, 2005). Interventions at this level are often supported by theoretical frameworks that identify key modifiable determinants of behaviour or "mechanisms of action" (MoAs; Michie et al., 2018), such as "knowledge" or "self-efficacy", that are then targeted by interventions to instigate behaviour change. Some of the most commonly used theories of health behaviour include: (1) The Reasoned Action Approach (also known as the Theory of Reasoned Action and Planned Behaviour; Fishbein & Ajzen, 2010), (2) The Health Belief Model (Jan & Becker, 1984), (3) The Transtheoretical Model of Health Behaviour Change (Prochaska et al., 1994), (4) Self-determination Theory (Ryan & Deci, 2017), and (5) Social Cognitive Theory (Bandura, 1986). **Appendix 1** describes these theories, their components, and how they might be applied in interventions addressing loneliness and social isolation. MoAs are linked to behaviour change techniques (BCTs) (Carey et al., 2019; Michie et al., 2018), which are the active components interventions that enable behaviour change (Carey et al., 2019; Michie & Johnston, 2013; Michie et al., 2018). More than 90 distinct BCTs have been used in health behaviour change interventions, with Michie et al. (2015) forming the Behaviour Change Technique Taxonomy that groups these into 16 categories (see **Appendix 2** for details). When linked with theoretical frameworks, these highlight key mechanisms of action that should be incorporated into individual-level health promotion strategies. An outline of these key MoAs are provided below:

- ***Education & Awareness.*** An essential component of health promotion is providing individuals with the information, knowledge and tools necessary for them to make healthier choices (Sharma, 2022). This information aims to make individuals aware of any unhealthy behaviours they may have and the potential poor health outcomes of these behaviours, as well as provide them with healthier alternatives (Arlinghaus & Johnston, 2018). Such strategies aim to influence an individual's beliefs, attitudes, and values about a behaviour, which is necessary for motivating and facilitating behaviour change (Sharma, 2022). It is important that this information is personalized and tailored to the individual (Arlinghaus & Johnston, 2018). Ethical health education practices must also protect the autonomy of the individual by providing them with the necessary information for behaviour change but ultimately allowing them to make their own choice (Pinho & Sampaio, 2022).
- ***Self-Efficacy***. Self-efficacy refers to one's belief that they are capable of behaviour change and have the skills and personal action control to obtain a desired outcome (Bandura, 1977; Schwarzer & Fuchs, 1996). It reflects a sense of control over one's actions and environment and is considered an essential driver of motivation (Bandura, 1997). According to Bandura's (1977) Self-Efficacy Theory, self-efficacy can be acquired through personal mastery experiences, vicarious experience through others, verbal persuasion from others, or enhancing one's emotional or physiological state. Increasing self-efficacy through any of these mechanisms can enhance a person's motivation to act and facilitate behaviour change (Schwarzer & Fuchs, 1996).
- ***Motivations and Values.*** Health promotion and behaviour change interventions must address participants' motives and values, which are underlying drivers of behaviour (Gable, 2006; Graham & Weiner, 2012; Tamir & Hughes, 2018). To have sustained

behaviour change, the outcomes of a new behaviour should align with a person's motivations and values. Interventions that aim to increase autonomous motivation (i.e., self-determined and involving a sense of volition and self-endorsemen) versus controlled motivation (i.e., coerced or feeling pressure to act) (Ryan & Deci, 2017), are more influential and more likely to produce long-lasting behaviour change (Ntoumanis et al., 2021; Ryan & Deci, 2017). Indeed, the purpose of health promotion is not to control, but to promote autonomy and ensure that individuals have the knowledge, skills, and ability to act in their interest (Pinho & Sampaio, 2022).

Individual-level interventions, such as psychotherapy, educational programming, and skill-building, have been used to target these key mechanisms to address issues of loneliness and social isolation in various populations. Psychotherapy-based interventions, such as cognitive behavioural therapy (CBT) and mindfulness training, work to modify maladaptive social cognitions and thought patterns, such as negative social expectations or feelings about past social encounters and relationships (Cacioppo et al., 2015; Mann et al., 2017; Masi et al., 2011). These interventions aim to reduce subjective experiences of loneliness and improve intrapersonal skills, ultimately improving how a person thinks about and experiences social situations (Masi et al., 2011). It is then theorized that changing a person's cognitions around socializing could lead to improved social behaviour which would further reduce feelings of loneliness over time (Mann et al., 2017; Masi et al., 2011). Psychotherapy-based interventions are some of the most widely investigated and supported methods of relieving loneliness (Cacioppo et al., 2015; Masi et al., 2011), with some evidence that these methods can be further enhanced with help from pharmacological treatment (Cacioppo et al., 2015). However, these methods seem to be most effective at reducing subjective feelings of loneliness, with little evidence supporting their ability to improve measures of social connection (Lindsay et al., 2019), aligning with the view that loneliness is a subjective experience (Cacioppo et al., 2015), and, therefore, modifying one's subjective cognitions around loneliness could change that experience (Masi et al., 2011). Psychotherapy-based interventions are relatively expensive and time-consuming (Cacioppo et al., 2015), and require access to and an understanding of a person's individual circumstances due to the complex, individualistic nature of loneliness (Mann et al., 2017). Thus, psychotherapy-based interventions could be prescribed to individuals who are at risk of or suffer from chronic loneliness (Masi et al., 2011; Cohen-Mansfield & Perach, 2015; Eccles & Qualter, 2021; Käll et al., 2020; Lindsay et al., 2019; Ma et al., 2020), indicating a need for health promotion efforts to increase attention to social health within primary health settings and training for health practitioners so that those at risk can be identified and supported.

Educational programming and skill-building interventions teach people knowledge and skills regarding social health (Arlinghaus & Johnston, 2018). Educational programs share information such as the benefits of social connection, health costs of loneliness, and practical ways people can improve their social connections (Mann et al., 2017), while skill-building interventions involve the active practice of, for example, social skills (Mann et al., 2017). These interventions aim to raise personal awareness on why social connection is important while equipping people with the necessary skills for successful socialization (Arlinghaus & Johnston, 2018; Mann et al., 2017). Such interventions can be delivered one-on-one, in group settings, or to the general public via public campaigns (Mann et al., 2017); however, they work at the individual level by ultimately attempting to positively influence people's personal attitudes, beliefs and behaviours toward social connection (Mann et al., 2017; Sharma, 2022). While there is limited evidence

that these approaches work in isolation, the evidence supports the use of educational programming and skill-building for reducing loneliness and social isolation when combined with other approaches, such as CBT or group activities (Cattan et al., 2005; Cohen-Mansfield & Perach, 2015; Eccles & Qualter, 2021; Ma et al., 2020, Mann et al., 2017; Pool et al., 2017), with some evidence that social health interventions in general are most effective when they include an educational or skill-building component (Cattan et al., 2005; Eccles & Qualter, 2021). Indeed, education is generally not sufficient for behaviour change on its own (Arlinghaus & Johnston, 2018) - for example, while most people are aware of the health risks of smoking, this does not stop millions of people from smoking daily. However, education and skill building is required to help people understand why a behaviour change is necessary and how they can do it (Arlinghaus & Johnston, 2018). Furthermore, such approaches, especially educational programming, are needed for ethical behaviour change by supporting individual autonomy and empowering people with the information required for them to decide how they can and would like to address their social health (Pinho & Sampaio, 2022).

Thus, individual-level health promotion can and should be used to target loneliness and social isolation (Cattan et al., 2005; Cohen-Mansfield & Perach, 2015; Deckx et al., 2018; Eccles & Qualter, 2021; Gardiner et al., 2018; Käll et al., 2020; Lindsay et al., 2019; Ma et al., 2020; Masi et al., 2011). Targeting the individual is key to influencing individual motivations, which is crucial to any behaviour change approach (Mann et al., 2017). However, individual-level interventions appear to be more effective when combined with other interventions (Leavell et al., 2019; Veazie et al., 2019; Cattan et al., 2005). In addition, such methods primarily take a downstream approach by treating as opposed to preventing loneliness and focusing too heavily on individual behaviours without taking into account the environment which may support or hinder the ability of a person to engage in a behaviour change (Baum & Fisher, 2014; Laverack, 2017; Van Den Broucke, 2014). Since social behaviours, by definition, require participation from others (Chen & Hong, 2018), without broader engagement at the interpersonal, community, and socio-political levels, individual-level efforts are likely to have limited impact and sustainability on their own (Mann et al., 2017). Therefore, while individual-level health promotion will be necessary for treating loneliness, combinations with multi-level approaches are still needed to prevent loneliness and support such strategies.

Interpersonal-Level Health Promotion. Intepersonal-level interventions involve individuals' immediate social networks and contexts, such as family, friends, peers, or health providers. Such interventions focus on people's relationships, social support, and social networks, harnessing the influence of these interpersonal resources to improve a person's health status and behaviours (Peterson et al., 2002; Riccio et al., 2019). These approaches often utilize individual-level behaviour change techniques and interventions, however, the focus is on the integration and impact of interpersonal processes and social support for enabling and enhancing self-regulatory behaviour (Riccio et al., 2019). For example, the effectiveness of action planning and goal setting for motivating physical activity can be enhanced through interpersonal processes such as dyadic action planning (i.e., planning a course of action with the support of partner) and the formation of collaborative goals with others (Riccio et al., 2019). Other examples of effective interpersonal interventions include family-based interventions, such as family therapy or family-based education and support interventions (Campbell, 2003), where there is evidence that engaging caregivers with the participating child is more effective at preventing and reducing childhood obesity, for example, versus targeting the child alone (Knowlden & Sharma, 2012; Sung-Chan et al., 2013). Peer approaches, such as peer support

groups and peer mentorship, which capitalize on sharing knowledge, experiences, and understanding between people undergoing similar experiences, have shown to improve abstinence, prevent relapse, and increase self-efficacy in people recovering from substance use disorders (Tracy & Wallace, 2016) while increasing the effects of other therapies when used in combination (Lopez et al., 2021). At the core of interpersonal-level interventions, is the idea that behaviours are strongly influenced by the people around us and that we tend to share the same lifestyle behaviours with those we are close with (Farrell et al., 2022; Pietromonaco & Collins, 2017). In addition, there is evidence that health behaviour change may be positively associated with the level of involvement from others during an intervention (Marsh et al., 2014). Indeed, in terms of social health behaviour, Cacioppo et al.'s (2015) assessment of loneliness posits that loneliness is bidirectional in its effects, in that it is equally about giving support to others and mutual aid, as it is about receiving support.

Social facilitation and supported socialization are interpersonal-level approaches that have been used to tackle social isolation and loneliness. Social facilitation interventions bring people together to promote socialization and social support between participants (Gardiner et al., 2018). This includes interventions such as befriending programs, social support groups, group-based activities, and scheduled contact with others (Anderson et al., 2015; Cattan et al., 2005; Chen & Schulz, 2016; Cohen-Mansfield & Perach, 2015; Gardiner et al., 2018; Ibarra et al., 2020; Perese & Wolf, 2005; Poscia et al., 2018; Powell et al., 2019; Pu et al., 2019; Siette et al., 2017). Supported socialization interventions, on the other hand, are those in which people are given support and guidance in finding opportunities for socialization, in which the "supporter" increases the chances of reducing loneliness and social isolation for the active participant by providing targeted support in finding, accessing, selecting, and engaging in social activities (Mann et al., 2017). This includes interventions such as social prescribing, health and social care provision from a health or social care professional, the provision of animal and robotic companions, and interventions that train people, usually seniors, to use technology to connect with others (Campaign to End Loneliness, 2020; Cotterell et al., 2018; Gardiner et al., 2018; Ibarra et al., 2020 Leavell et al., 2019; Poscia et al., 2018). The evidence largely supports the use of interpersonal-level interventions for improving measures of loneliness and social isolation (Anderson et al., 2015; Cattan et al., 2005; Chen & Schulz, 2016; Poscia et al., 2018; Ibarra et al., 2020; Gardiner et al., 2018), with some evidence suggesting that these interventions may be more effective at improving objective measures of social isolation, such as the number or quality of a person's relationships or networks, as opposed to reducing subjective feelings of loneliness (Cotterell et al., 2018; Ibarra et al., 2020; Ma et al., 2020; Mann et al., 2017; Masi et al., 2011; Noone et al., 2020).

However, the mere delivery of social health interventions with others does not always improve its effectiveness. While several reviews have found social health interventions to be more effective when delivered in group formats (Cattan et al., 2005; Dickens et al., 2011; Hagan et al., 2014; Pool et al., 2017), others either did not support this effect or found similar interventions equally successful in one-on-one settings (Cohen-Mansfield & Perach, 2015; Eccles & Qualter, 2021; Gardiner et al., 2018; Masi et al., 2011; Poscia et al., 2018). Indeed, the underlying mechanisms of action supporting interpersonal-level processes are not well understood (Riccio et al., 2019). However, it seems that social isolation and loneliness may be more likely to be improved upon when interpersonal-level interventions include components of relationship building and strengthening between participants, or when group members share similarities such as belonging to the same generational, cultural or social background (Cattan et al., 2005;

Hagan et al., 2014; Mann et al., 2017; Miyawaki, 2015). Indeed, people are more likely to engage in prosocial behaviours with those they are closest to and share an in-group mentality with, and will experience greater reward when doing so (Tamir & Hughes, 2018). The evidence also suggests that interventions should include participants in the design of the intervention, the intervention itself involve active engagement from the participants, such as learning a new hobby or skill, and that the interventions are tailored to the participants in question, such as centred around a shared interest (Cattan et al., 2005; Dickens et al., 2011; Gardiner et al., 2018; McElfresh et al., 2021). These techniques are thought to increase autonomy, confidence, and self-efficacy in participants (Cattan et al., 2005; Chen & Schulz, 2016; Hagan et al., 2014), supporting sustained behaviour change. Thus, to instigate prosocial behaviour, health promotion efforts should encourage people to plan their own social activities with individuals they are close to or share something in common with. Additionally, endorsing activities that actively engage participants, such as a fitness activity or attending a class, can help foster feelings of social connection among participants. Notably, the involvement of a health care professional in the delivery of interventions was shown to increase the effectiveness of multiple interventions (Anderson et al., 2015; Käll et al., 2020; Veazie et al., 2019). This further reinforces the need for enlisting the support of health care providers and increasing attention to social isolation and loneliness in healthcare settings, as the evidence thus suggests that their influence could increase the effectiveness of health promotion efforts.

Community-Level Health Promotion. Community-level approaches integrate individual- and interpersonal-level interventions into the immediate social context in which people are regularly and naturally situated, such as workplaces, neighbourhoods, and schools (Wandersman & Florin, 2003). These approaches draw on social-ecological models of behaviour change, which posit that behaviour change requires influences from a person's broader social contexts, including the people with whom they associate, the organizations to which they belong, and the communities in which they live (McLeroy et al., 2003). Community-level actions have involved community mobilization and settings-based approaches to address a number of health issues, including smoking cessation (Bennett et al., 2017; Cahill & Lancaster, 2014; Secker-Walker et al. 2002), preventing obesity (Bleich et al., 2013; Economos & Irish-Hauser, 2007), and improving HIV outcomes (Dave et al., 2019; Salam et al., 2014).

Community-level interventions consider the ways in which local authorities and groups can support the development of activities and interventions that address loneliness and social isolation within their respective communities (Campaign to End Loneliness, 2020). Examples of community-based interventions that have been explored to address social isolation and loneliness include community projects such as community gardens, community-based volunteer opportunities, the creation of local activity groups such as fitness and arts classes, and home visiting and community outreach programs (Campaign to End Loneliness, 2020; Dickens et al., 2011; Leavell et al., 2019; Mann et al., 2017; O'Rourke et al., 2018; Poscia et al., 2018; Veazie et al., 2019). Such approaches provide opportunities for people to spend more time socializing, expand their social networks, and develop meaningful roles in their communities (Bridger & Luloff, 1999; Dozier et al., 2012; Agonafer et al., 2021; Noon et al., 2021; Grillich et al., 2023). A multi-component approach is often used and thought to be most effective when addressing social health issues at the community level (Cotterell et al., 2018; Ma et al., 2020; Mann et al., 2017; Poscia et al., 2018). Indeed, successful public health interventions should engage the individual with reinforcement and support from multiple community outlets (Ockene, 1992). An example of this approach is The Cares Family program

in the United Kingdom, a community-based intervention that uses activity groups ("social clubs"), community outreach and supported socialization services, and community development strategies to help build meaningful relationships and expand community connections (Campaign to End Loneliness, 2020). Since loneliness is a subjective experience, and social isolation is heavily influenced by a person's individual circumstances, combatting social isolation and loneliness will be different for every person (Eccles & Qualter, 2021; Ma et al., 2020; Mann et al., 2017; Poscia et al., 2018). In addition, evidence has shown that different social groups have been found to respond differently to similar interventions (Siette et al., 2017). Thus, integrating a variety of individual and interpersonal-level interventions at the community level provides opportunity for social isolation and loneliness to be addressed in a variety of ways, and for individuals to choose the interventions that are best for them.

Community-level interventions have also been found to be more effective when participants were engaged in the development of the intervention (Cattan et al., 2005; Gardiner et al., 2018; McElfresh et al., 2021), with asset-based community development (ABCD) recommended as an intervention approach in itself to promote community connectedness (Gardiner et al., 2018; Mann et al., 2017). Engaging community members in the design of the intervention allows the community to capitalize on existing resources and adapt interventions to best meet their needs, strategies that have shown to make social health interventions more effective (Cattan et al., 2005; Gardiner et al., 2018; McElfresh et al., 2021; Poscia et al., 2018). An ABCD approach also allows for capacity building among community members, which has been identified as vital for mediating between health promotion and population-level health outcomes (McLeroy et al., 2003), and for supporting program sustainability (Campaign to End Loneliness, 2020; Gardiner et al., 2018). Thus, health promotion efforts should be settings-based and aim to empower individuals from communities to come together to develop activities and interventions that address loneliness and social isolation in ways that are available and relevant to them.

Currently, there is currently little data on the effectiveness of community-level approaches to addressing loneliness and social isolation (Cohen-Mansfield & Perach, 2015; Cotterell et al., 2018; Masi et al., 2011). However, it is recognized that individual and interpersonal-level approaches will have limited impact if there are no broader efforts to connect and integrate them within the communities which people live (Mann et al., 2017). Thus, more focus is needed on developing and evaluating community-level interventions for addressing social isolation and loneliness in order to capitalize on their potential influence (Cattan et al., 2005; Cohen-Mansfield & Perach, 2015).

Socio-Cultural Health Promotion. The goal of health promotion is not only to change individual behaviours, but also to embed public health values in our social ecology and culture. Thus, socio-cultural level health promotion employs strategies aimed at influencing attitudes and the way populations think about a health issue, to bring about widespread and permanent health behavioural change (McLeroy et al., 2003). Societal and cultural change interventions have been implemented through means such as social marketing, mass media campaigns, and public policy measures, such as legislating smoke-free environments and nutrition labelling on food packaging (Almestahiri et al. 2017; Bala et al., 2017; Durkin et al., 2012; Hawkes et al., 2015; WHO, 2003). These interventions are highly context-dependent, and consider the cultural and social climates in which they are implemented (Minian et al. 2020). The most successful of these have focused on modifying external factors like resource accessibility, social or physical environment changes, and improving people's social support systems (Minian et al., 2020).

Golechha (2016) suggests prioritizing interventions that focus on societal, attitudinal, and environmental changes, also known as "upstream" approaches, before addressing individual behavioural change. These approaches aim to modify societal conditions or the social determinants of health, which often shape individual behaviours, making them highly beneficial for health promotion (NCCDH, 2014). Indeed, it is recognized that approaches to addressing social isolation and loneliness need to be considered in the context of wider social policies, including housing, employment, welfare benefits, and infrastructure (Mann et al. 2017).

The goal of interventions at this level are to bring wider awareness and active participation to promoting social connectedness and preventing loneliness, empowering people and reducing stigma around loneliness to normalize and create a more receptive environment for social health action (Mann et al., 2017). For example, education policies could promote social health by building social health education into school curriculums, allowing for school-age children and adolescents to learn about healthy social functioning and preventing social isolation and loneliness throughout the lifetime (Qualter et al., 2015). As previously discussed, there are also calls for increased attention to social health in primary care and medical training, by educating health practitioners with the knowledge and tools required to identify and support people at risk of loneliness within their practice (Cacioppo et al., 2015; Mann et al., 2017). Urban planning and the built environment are other ways that social isolation and loneliness can be addressed using socio-political measures by ensuring neighbourhoods, communities, and cities are designed to enable social connection (Bower et al., 2023). This could encompass a range of strategies, such as designing more inclusive and safe public spaces, improving access to affordable community and natural spaces that could provide venues for social groups, and making private spaces more available for use by the general public (Bower et al., 2023). Finally, investing in gateway infrastructure, such as public transportation and digital access, will also be important in ensuring people have the resources to access services, groups, and activities that allow them to connect with others (Gardiner et al., 2018; Lamanna et al., 2020; Newman et al., 2019). Engaging policymakers and health and local government commissioners is therefore crucial for health promotion efforts, to allow for the appropriate interventions to be integrated across sectors and at different levels of society (Leigh-Hunt et al., 2017).

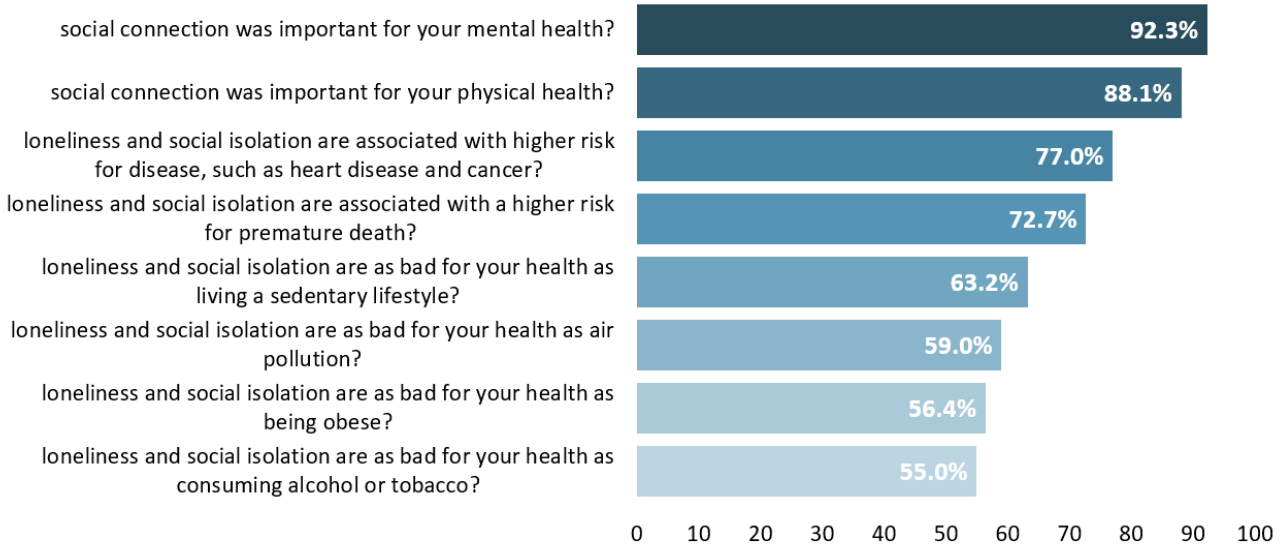
A number of national and international strategies have been implemented worldwide to address social isolation and loneliness, such as the Campaign to End Loneliness in the UK, Ending Loneliness Together in Australia, the Foundation for Social Connection in the United States, the World Health Organization's Social Isolation and Loneliness initiatives, and the Global Initiative on Loneliness and Connection (Taylor et al., 2023). The United Kingdom, has an appointed Minister for Loneliness and dedicates millions of dollars towards initiatives that address loneliness and social isolation each year (Kennedy, 2018). Recently, the US published an advisory release from the U.S. Surgeon General calling for action to address the loneliness and isolation epidemic (OSG, 2023). Such strategies bring wider public awareness to social health issues, create demand and pressure for socio-political change, and help redirect funding towards social health initiatives, such as social health research and the availability of interventions to address social isolation and loneliness in communities (Rothwell & Wissema, 1986).

There is little evidence evaluating the effectiveness of existing socio-cultural level health promotion efforts for social isolation and loneliness (Cattan et al., 2005; Mann et al., 2017). However, health promotion at the socio-political is necessary for a holistic approach to

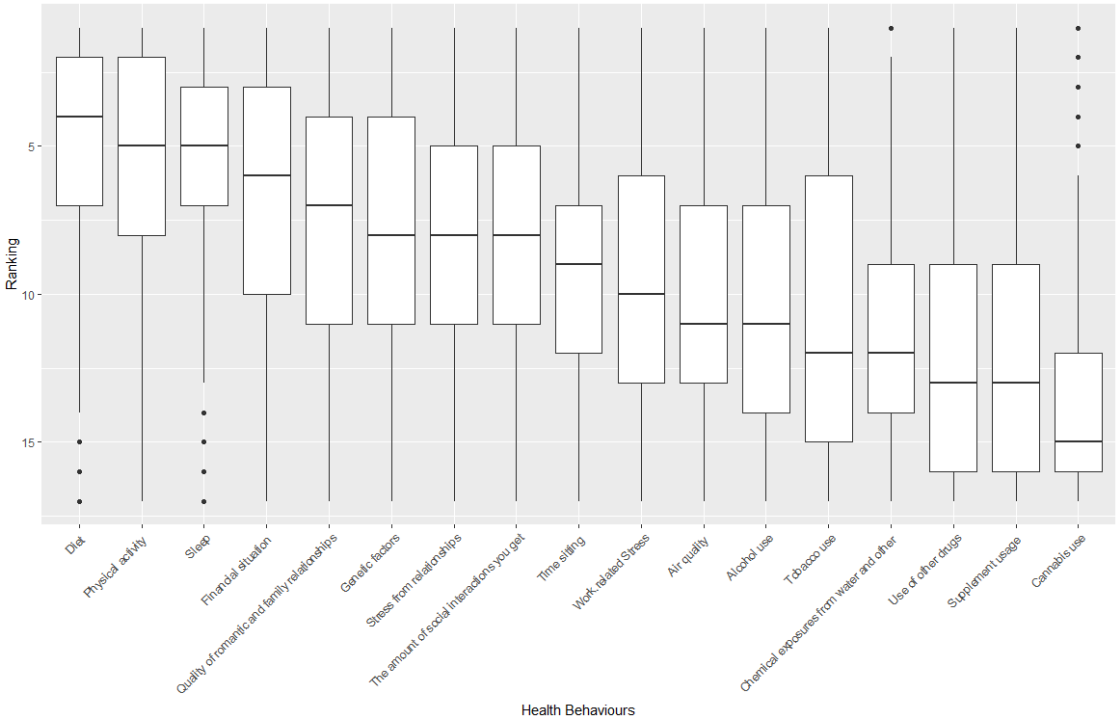
addressing social isolation and loneliness, and for enabling sustainable action at the individual, interpersonal and community levels (Kumar & Preetha, 2012).

Analyses from the Canadian Social Connection Survey

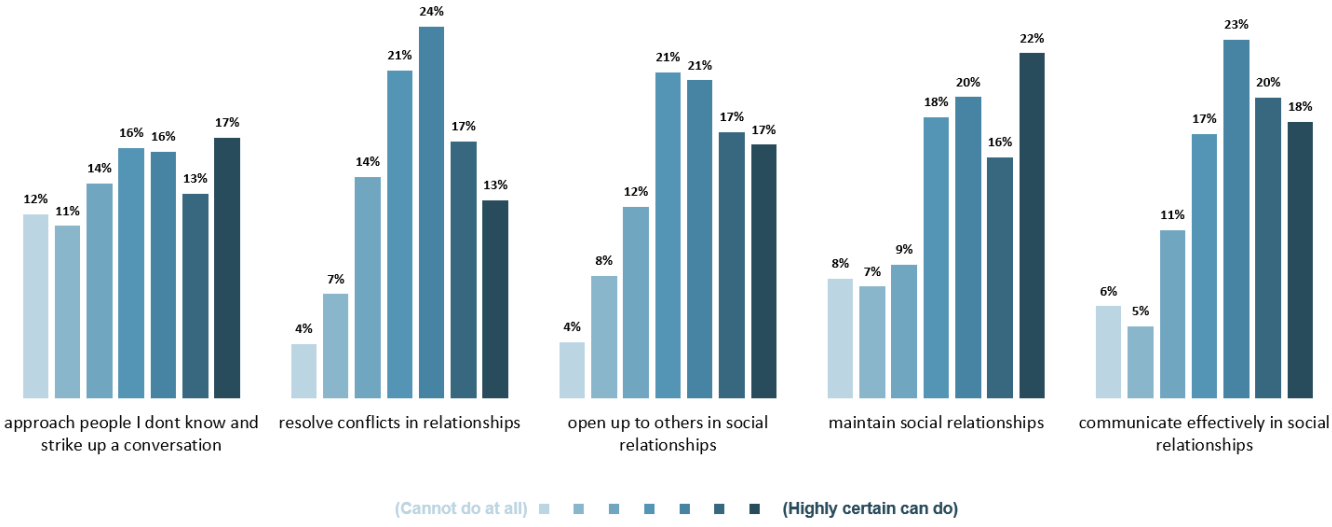
Using data from the 2022 Canadian Social Connection Survey, we explored the extent to which participants (n = 295) were aware of the impact and severity of social isolation. Overall, a high proportion of participants reported being aware that social connection was important to their mental health (92%) and physical health (88.1%). However, participants were much less likely to report being aware of the severity of loneliness, with considerably fewer (~60%) recognizing that it is equal to other risk factors such as sedentary behavior, air pollution, and obesity.



In 2023, we expanded upon these analyses, by asking participants (n = 327) to rank a wide range of health-related factors. This allowed us to better understand participant's patterns of responses. In doing so, diet, physical activity, and sleep were highly ranked, as was financial situation. After these variables, participants also reported a high ranking for relationship quality. Following these, participant's next most highly ranked factors were genetic factors, relationship stress, and amount of social interaction. Beyond these, were sitting, air quality, alcohol use, tobacco use, chemical exposures, drug use, nutritional supplement use, and cannabis use. In short, participants rate social connections moderately highly in their assessment of health behaviours – but do not ascribe social connections as the same priority status as other health related behaviours that have previously benefitted from public health promotion efforts.



In addition to looking at knowledge, we also examined 2022 participant's (n = 862) responses regarding their self-reported social self-efficacy across several social behaviours, including striking up conversations, resolving conflicts, opening up to others, maintaining connections, and communicating effectively. Generally speaking, less than one-in-five participants reported being "highly certain" that they could do each of these five tasks, indicating that a substantial proportion of individual's experience difficulties with these social skills. However, the bulk of individuals were more confident then not in their abilities, with the distributions of most behaviours skewing towards greater self-efficacy. Notably, participants reported the least self-efficacy around striking up conversations – suggesting that relationship initiation may be particularly problematic for individuals.



Discussion

The evidence discussed above underscores the importance of comprehensive health promotion strategies in addressing loneliness and social isolation. There is a clear need for interventions that extend beyond individual behaviour, encompassing the broader interpersonal, communal, and socio-cultural contexts in which these behaviours occur. Furthermore, due to the difficulty of treating chronic and severe loneliness, prevention-focused approaches, which seek to halt the emergence of unhealthy behaviours and related health outcomes, should be emphasized in health promotion strategies – particularly given their relative ease of implementation, cost-effectiveness, and sustainability. However, implementing such population-level health promotion strategies presents unique challenges and there are few strong examples of such practices applied to issues related to social health and wellbeing. Among the challenges faced by such efforts are the complexities of comprehending and addressing various social determinants of health, adapting interventions to distinct cultural and social contexts, reaching the right individuals and communities, and dealing with the resource-intensive nature of such strategies. Thus, a careful balance must be maintained between the ambition for comprehensive population-level strategies and the practical considerations involved in their implementation. In particular, efforts must be undertaken to ensure that population-level interventions are equitable, non-stigmatizing, and inclusive.

Conclusion

Based on the information summarized above, we recommend multi-component, multi-level interventions at the individual, interpersonal, community, and societal level that aim to motivate social connection, reduce barriers to social interaction, and provide individuals with the resources and skills needed to develop and deepen their relationships with others. The implementation and evaluation of these interventions will greatly improve our ability to respond to issues related to the social health of individuals and communities.

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Appendix 1. Behaviour Change Theories and Frameworks

Definition	Major Components	Application to Social Connection and Loneliness
Reasoned Action Approach (Also known as the '*Theory of Reasoned Action*' and the '*Theory of Planned Behaviour*'; Fishbein & Ajzen, 2010; Hagger, 2019; McEachan et al., 2016)		
Behaviour is motivated by a person's intention to perform a behaviour, which in turn is informed by the person's beliefs about that behaviour.	One's behavioural intention is informed by three distinct beliefs: 1. "Behavioural beliefs" or attitudes toward the behaviour; the more the behaviour is perceived to have a positive outcome, the more likely the person will engage in the behaviour. Behavioural beliefs are in turn determined by experiential and instrumental attitudes. 2. "Perceived norms" or perceptions of what others think as acceptable behaviour; if important people in a person's life are believed to approve of, or if they themselves perform the behaviour, a person will be more likely to also engage in the behaviour. Perceived norms are in turn determined by injunctive and descriptive norms. 3. "Perceived behavioural control (PBC)", or the perceived ability to perform a behaviour; the more one believes they can perform the behaviour, the more likely that they will. PBC is in turn determined by capacity and autonomy.	Group social skills interventions aimed at increasing social skills and knowledge of the benefits of socialization (Steinmetz et al., 2016). Such interventions could shift attitudes toward socializing more positively while increasing participants' perceived and actual capacity to do so. The group setting is inducive to a norms transformation strategy for shifting beliefs in the perceived norms of socialization (Cislaghi & Berkowitz, 2021).
The Health Belief Model (Jan & Becker, 1984; Rosenstock et al., 1988)		
Behaviour depends upon two variables: (1) the value placed by an individual on a particular goal, such as the desire to avoid illness); and (2) the individual's estimate of the likelihood that a given action will achieve that goal (the belief that an action will avoid illness).	These variables are influenced by six dimensions: 1. Perceived susceptibility – how much a person believes they are susceptible to contracting an illness. 2. Perceived severity – the seriousness or consequences of contracting an illness. 3. Perceived benefits – the beliefs in the positive features or advantages of engaging in a behaviour, including its ability to reduce a person's susceptibility or severity of an illness.	Motivational interviewing (MI) provided by a person's general health practitioner could provide a targeted approach to creating or enhancing a person's perception of their susceptibility to loneliness, the severity of its health consequences, and the benefits of engaging in positive social behaviours. A general practitioner can then provide a personalized treatment plan that considers an individual's unique perceived barriers and provides a cue to action through strategies such as social prescribing. A central concept of MI is its proficiency in improving one's self-

	4. Perceived barriers – obstacles to taking action or negative consequences created in taking action. 5. Cue to action – any internal or external factor that can trigger action. 6. Self-efficacy – the confidence a person has in their ability to perform a behaviour	efficacy (Britt et al., 2004).
The Transtheoretical Model (TTM) of Health Behaviour Change (Prochaska et al., 1994; Prochaska & Velicer, 1997)		
Changing behaviour is a process that occurs in a series of stages determined by a person's readiness to engage in a behaviour; a person can progress or regress through the stages over time.	The six stages of behaviour change include: 1. *Pre-contemplation*: a person does not intend on taking action in the foreseeable future, as they are likely unaware of the negative consequences of that behaviour and do not see the benefit of behaviour change. 2. *Contemplation*: a person intends to take action in the near future as they are aware of the benefits of behaviour change. However, the pros and cons of behaviour change produce ambivalence which can cause behavioural procrastination. 3. *Preparation*: a person intends on taking action in the immediate future, typically has a plan of action, and may have already some action; they believe that the behaviour change will lead to positive outcomes. 4. *Action*: a person has recently changed their behaviour and intends on continuing with that behaviour. 5. *Maintenance*: a person works to prevent relapse to previous stages and sustain their behaviour change for the long-term. 6. *Termination*: a person has reached complete self-efficacy, has zero intention to return to their old, unhealthy behaviour, and will not relapse; most people do not reach this stage and stay in maintenance. Three factors support the transfer between different stages: processes of change (ten in total); decisional balance; and self-efficiency.	Multi-component intervention strategies would be most useful when adopting a TTM model, as individuals in populations are likely to be at different stages of behaviour change. For example, education-based interventions that inform individuals about the benefits of positive social behaviours and provide tips and tools for social connection can support individuals through the pre-contemplation, contemplation, and action stages (Hashemzadeh et al., 2019). Social influences and positive reinforcement become particularly influential in the latter stages of the model, with the availability of family and community interventions, such as community programming, providing the opportunity for individuals to act on their intentions to socialize and receive social support from others (Ferron & Massa, 2013).

Self-Determination Theory (Ryan & Deci, 2017; Ryan & Deci, 2022)		
People are motivated to behave in ways that satisfy their inherent need for autonomy, competence, and relatedness. These in turn influence the quality of one's motivation, which is more important than quantity for motivating behaviour and behaviour change.	Self-initiated behaviour is motivated by three innate and universal psychological needs: 1. Autonomy – the feeling that one has choice and control over their behaviour. 2. Competence – one's ability to effectively perform a behaviour. 3. Relatedness – the need to feel connected and belong with others. Satisfying these needs leads to more autonomous motivation (the extent to which behaviours originate from the self) versus controlled motivation (the extent to which behaviours are pressured or coerced), with autonomous motivation leading to sustained behaviour change.	Effective behaviour change strategies rooted in self-determination theory target autonomous motivation and basic psychological need support. Mass media campaigns that tap into people's needs for relatedness by promoting social connectivity, and using need-supportive communication delivered by influential social agents, can promote autonomous motivation and perceived competence, motivating people to act more socially. These can be paired with 'if-then' action planning interventions to provide structure and translate motivation into action (Hagger et al., 2020; Sheeran et al., 2020).
Social Cognitive Theory (Bandura, 1986; Luszczynska & Bandura, 1998)		
Health behaviour is influenced by reciprocal interactions between an individual, their environment, and their existing behaviour. It is unique in that it emphasizes social contexts in learning behaviour, with a central assumption that we learn new behaviours by observing the behaviour of others and the consequences of their actions. In addition, sustaining behaviours over time requires environmental reinforcement and individual self-regulation.	Individual or cognitive factors (also known as "personal factors") include knowledge, expectations, and attitudes. Environmental factors can include social norms, access in community, and influence on others. Behavioural factors include skills, practice, and self-efficacy. There are six constructs that influence individual behaviour change: 1. Reciprocal determinism – the central concept of SCT, refers to the dynamic, reciprocal interaction between the individual, their environment, and their behaviour. 2. Behavioural Capability – a person's ability to perform a behaviour, based on their knowledge and skills. 3. Observational learning – people can watch and observe the behaviours of others, and then model that behaviour to achieve a desired outcome. 4. Expectations – the anticipated outcomes of a behaviour. 5. Reinforcements – the actual consequences of behaviour affect the likelihood of that behaviour being continued.	Interventions focused on social cognitive theory primarily target self-efficacy and outcome expectancies while taking advantage of social influences. Group-based interventions that teach social skills through modelling could allow participants to learn by observing others and practicing social behaviour themselves. This would allow participants to experience positive outcomes from the behaviour, increasing their self-efficacy for social behaviours and encouraging them to continue the behaviour outside of the intervention setting (Luszczynska & Schwarzer, 2020).

	6. Self-efficacy – the level of confidence a person has in their ability to perform a behaviour	

Appendix 2. Behaviour Change Technique Taxonomy

Grouping	Behaviour Change Technique Taxonomy
Goals and planning	Goal-setting; problem-solving; action planning; review behaviour goal(s); review outcome goal(s); discrepancy between current behaviour and goal; behavioural contract; commitment
Feedback and monitoring	Monitoring of behaviour by others without feedback; feedback on behaviour; self-monitoring of behaviour; self-monitoring of outcome(s) of behaviour; monitoring of outcome(s) of behaviour without feedback; biofeedback; feedback on outcome(s) of behaviour
Social support	Unspecified, practical, or emotional
Shaping knowledge	Instruction on how to perform the behaviour; information about antecedents; re-attribution; behavioural experiments
Natural consequences	Information about health consequences; salience of consequences; information about social and environmental consequences; monitoring of emotional consequences; anticipated regret; information about emotional consequences
Comparison of behaviour	Demonstration of the behaviour; social comparison; information about others' approval
Associations	Prompts/cues; cue signalling reward; remove access to the reward; remove aversive stimulus; satiation; exposure; associative learning
Repetition and substitution	Behavioural practice/rehearsal; behaviour substitution; habit formation; habit reversal; overcorrection; generalisation of target behaviour; graded tasks
Comparison of outcomes	Credible source; pros and cons; comparative imagining of future outcomes
Reward and threat	Material incentive; material reward; non-specific reward; social reward; social incentive; non-specific incentive; self-incentive; incentive (outcome); self-reward; reward (outcome); future punishment
Regulation	Pharmacological support; reduce negative emotions; conserving mental resources; paradoxical instructions
Antecedents	Restructuring the physical environment; restructuring the social environment; avoidance/reducing exposure to cues for the behaviour; distraction; adding objects to the environment; body changes
Identity	Identification of self as role model; framing/reframing; incompatible beliefs; valued self-identify; identity associated with changed behaviour
Scheduled consequences	Behaviour cost; punishment; remove reward; reward approximation; rewarding completion; situation-specific reward; reward incompatible behaviour; reward alternative behaviour; reduce reward frequency; remove punishment
Self-belief	Verbal persuasion about capability; mental rehearsal of successful performance; focus on past success; self-talk
Covert learning	Imaginary punishment; imaginary reward; vicarious consequences

See Michie et al. (2015) for additional descriptions of each Behaviour Change Theory.

Appendix 3. Description of Dr. Card's Biopsychosocial Model of Behaviour and Application to Social Health

The biopsychosocial model of behaviour integrates structural, biological, and psychological factors to comprehensively explain human actions. At the broadest level, social context, social position, social systems, and material circumstances define the structural, cultural, and social milieu in which individuals reside. Key mechanisms interconnecting these elements include processes related to power and capital, policy, politics, and systemic forms of discrimination (e.g., the "isms"). Within this social fabric, individuals acquire a distinct psychosocial disposition, which in turn influences their preference for certain social environments and situations. Concurrently, these social environments can induce alterations in an individual's biological response and function, amplifying their sensitivity to surrounding social stimuli. This biological modulation can mould an individual's cognition, thus influencing their psychosocial disposition, or elicit compulsive actions directly influencing behaviour. The psychosocial disposition further delineates how individuals interpret behaviours, the norms they associate with these behaviours, their perceptions of the behaviours' merits, and potential barriers. Utilising a reasoned action framework, these interpretations culminate in specific behaviours. As individuals act, they not only modulate their biological responses but also reinforce societal conceptions in their environments, establishing feedback mechanisms that bolster the foundational antecedents of behaviour. Lastly, the consequences of behaviours, both positive and negative, exert a compounding effect, reshaping both environmental perceptions and individual psychosocial dispositions.

In the realm of human social behaviour, structural influences play a pivotal role. The social context, for instance, is paramount. Communities characterized by robust communal values, where collective activities and mutual support are foundational, inherently foster prosocial behaviours. Such environments create a conducive backdrop for altruistic actions. Equally influential is an individual's social position. The role one assumes in society, whether as a teacher, leader, or elder, can significantly steer their prosocial inclinations. To illustrate, community leaders, due to the responsibilities and expectations vested in their roles, might exhibit a heightened propensity to assist others. Delving deeper into structural determinants, the configuration of social systems and the prevailing material circumstances cannot be overlooked. In societies marked by stark income disparities, the behaviours exhibited by those in privileged echelons can be dichotomous. Some might manifest amplified charitable behaviours, driven by a sense of duty, while others could display diminished prosocial tendencies, stemming from a detachment from the tribulations of the underprivileged.

Transitioning from structural parameters, the mechanisms linking societal constructs to individual behaviours merit attention. In societies where the accumulation of wealth is synonymous with power, the motivations of affluent individuals often extend beyond mere altruism. Their charitable endeavours might be influenced by a desire to consolidate their societal standing. Parallelly, the domain of policy and politics exerts its own influence. Legislative measures, such as tax incentives for philanthropic contributions, can catalyze prosocial behaviours. However, one cannot disregard the shadow of discrimination or "isms" that looms large. Discriminatory practices can either stymie or invigorate prosocial behaviours. As a coping strategy, marginalized cohorts might forge close-knit communities, amplifying mutual support and solidarity.

Delving into the biological realm, the physiological responses to social stimuli are profound. Chronic immersion in stressful social milieus can escalate cortisol levels, potentially curtailing an individual's sociability. In contrast, uplifting social encounters can trigger the release of oxytocin, a hormone intrinsically linked with bonding and prosocial actions. Complementing these biological reactions is the psychosocial disposition of individuals. Those nurtured in environments where prosocial behaviours are lauded are predisposed to value altruism. Their cognitive frameworks, moulded by their upbringing, resonate with the ethos of community and collaboration.

Behaviours, once manifested, set into motion a cascade of feedback loops. The act of engaging in prosocial endeavours elicits feedback, both biologically, as in the euphoria from endorphin release, and socially, through accolades from one's peers. These positive reinforcements perpetuate prosocial actions and progressively sculpt the social norms of the community, amplifying altruistic tendencies. Furthermore, the repercussions of these behaviours have a domino effect. The aggregate impact of consistent prosocial actions has the potency to reshape cultural paradigms. In communities where acts of benevolence become routine, such gestures attain a normative status, guiding the behaviours of newcomers or succeeding generations. This perpetuating cycle, underpinned by the collective recollection of positive outcomes, continually refines individual psychosocial orientations, steering them towards greater sociability and altruism.

In sum, the willingness to act prosocially or to engage sociably with others is not a simple product of innate tendencies or momentary decisions, but a complex outcome shaped by a confluence of structural, biological, and psychological influences.