

More meaning, less loneliness?
A Scoping Literature Review on the Relation Between Meaning in Life and Loneliness

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Abstract

Background: While it is well-established that loneliness results in a decreased sense of meaning in life, recent research has indicated that this relationship might be bidirectional. Specifically, it has recently been proposed that meaning in life might have beneficial effects for the prevention and reduction of loneliness by increasing attractiveness, positive regard towards others and coping. However, the research on this relationship is currently scarce and little is known about the underlying mechanisms that can explain the proposed buffering effect of meaning in life against loneliness. The aim of this study was to assess the current state of quantitative evidence. **Method:** A systematic scoping review was performed. This included a systematic literature search of three online databases, focusing on quantitative research on the meaning-loneliness relationship that included an analysis of mediating or moderating factors. The included studies were assessed regarding their study characteristics as well as their results. **Results:** The literature search resulted in 11 cross-sectional studies and one experimental study. Within these, meaning in life and loneliness were found to be consistently negatively related across studies with small to moderate effect sizes. The variables mindfulness, positive orientation and religious coping showed significant mediation effects, while nostalgia, reflection, search for meaning, religiosity and resilience showed significant moderation effects. **Discussion:** While the reviewed studies homogeneously found loneliness and meaning in life to be negatively related to each other, there is a lack of evidence concerning the causalities and the underlying mechanisms involved in this relation. While the current state of evidence showed no support of the hypothesized role of attractiveness and positive regard towards others as underlying mechanisms of the meaning-loneliness relation, the study results were compatible with the hypothesized role of coping. There is a need for longitudinal research to gain more insight into the causalities and underlying factors involved in the bivariate relation between meaning and loneliness.

Keywords: meaning in life, loneliness, scoping review

Introduction

While the topic of loneliness has risen in prominence and relevance in the context of the COVID-19 pandemic and the related protective measures, it has already been treated and studied as an increasingly pressing health problem before that (Klinenberg, 2016; Valtorta et al., 2016). Loneliness has been shown to be related to several physical health problems such as coronary heart disease and mortality, as well as to mental health problems such as depression and anxiety (Lim et al., 2020; Valtorta et al., 2016). Being lonely has further been linked to an increased risk of unhealthy behaviors such as smoking or living a sedentary lifestyle (Cacioppo et al., 2002; Dyal & Valente, 2015; Lim et al., 2020; Valtorta et al., 2016; Vancampfort et al., 2019). The immense economic burden and the individual suffering caused by these consequences of loneliness has created a need for effective interventions to reduce and prevent loneliness (Masi et al., 2011). Such interventions commonly focus on aspects directly related to social interactions such as social skills, social cognitions or the frequency of social interactions (Masi et al., 2011). However, there is another relevant correlate of loneliness that has recently been proposed as a potential target of interventions aiming to reduce loneliness, namely the sense of meaning in life (Macià et al., 2021).

Meaning in life has been established in the field of Psychology as a vital component of well-being and mental health (King et al., 2016; Li et al., 2021). A high degree of perceived meaning has been found to be associated with higher mental as well as physical well-being (Li et al., 2021; Roepke et al., 2014). Concordantly, clinical interventions designed to enhance the perceived degree of meaning in life have been found to be effective in improving the general quality of life, self-efficacy and optimism as well as reducing psychological distress (Vos & Vitali, 2018). Recent research proposed that just as an increased sense of meaning is beneficial for general mental and physical health, it might also lead to decreases in loneliness and be preventive of the development of loneliness (Folker et al., 2021; Macia et al., 2021). Concordantly, a recent meta-analysis found that a higher degree of purpose in life, which is considered to be a crucial component of meaning in life, is a protective factor against the development of loneliness longitudinally (Sutin et al., 2022). This finding further expanded on initial cross-sectional evidence indicating that a higher sense of purpose is related to lower loneliness in elderly men (Neville et al., 2018), as well as evidence from a machine-learning study that found loneliness to be the strongest correlate of purpose compared to various other factors (Mei et al., 2021).

Despite these recent findings and hypotheses that could have relevant implications for the prevention and treatment of the issue of loneliness via the enhancement of meaning in life,

more research is needed and little is known about the explanation of the protective or buffering effect that meaning or purpose could have on loneliness in terms of underlying mechanisms of this relationship (Sutin et al., 2022). In accordance with this need for more research, the present review assessed the state and scope of research on the underlying and contributing factors of the relationship between meaning in life and loneliness in terms of what is currently known about mediating and moderating factors of that relationship. For the sake of a more focused assessment of the state of evidence, this review specifically evaluates a recent hypothesis by Folker et al. (2021), who proposed improvements of coping, attractiveness and positive regard towards others to be relevant mechanisms of a protective effect of meaning against loneliness. Gaining further insights into the relationship between meaning in life and loneliness can have implications concerning the general suitability of meaning-based treatment of loneliness, suitable target variables of interventions and suitable target groups. The following sections provide definitions, theories and an overview of recent findings surrounding meaning in life, loneliness, and the relationship between the two.

Definition and function of loneliness

Loneliness can generally be defined as a subjective, emotional state of dissatisfaction with one's social relations in terms of quality or quantity (Cacioppo et al., 2002; Folker et al., 2021; Lim et al., 2020). It has been proposed to be composed of the two dimensions emotional loneliness, referring to a perceived lack of emotional bonds or connection with others, and social loneliness, referring to the perceived lack of belonging to a larger social constellation such as a certain group (Buecker et al., 2020). The subjective and evaluative characteristics of loneliness make it distinct from more objective concepts related to an individual's social relations such as social isolation (de Jong Gierveld & Havens, 2004). This is also supported by research that shows how similar social arrangements can lead to different perceptions of loneliness in different people, indicating that loneliness seems to be highly dependent on the individual interpretation and perception of one's social life (Klinenberg, 2016; Macià et al., 2021). While loneliness is mainly studied based on the beforementioned negative effects it can have for mental and physical health, the following paragraph addresses how researchers consider it to originally serve an adaptive function.

The evolutionary function of loneliness has been theorized to be a state of discomfort that ought to stimulate behavior change towards maintaining and initiating high-quality social relationships for survival, health and safety (Cacioppo et al., 2006, 2014). Viewed from this lens, loneliness principally serves an adaptive purpose as a transient pain that motivates social health and only becomes deteriorating for health by becoming chronic (Goossens, 2018). While

this generally frames loneliness as an adaptive process, the development of chronic loneliness has been proposed to be partially caused by specific consequences of loneliness itself (Goossens, 2018). These consequences are maladaptive cognitions that lonely people commonly develop, such as increased vigilance for social threats and an increased focus on self-preservation (Cacioppo et al., 2017; Nikitin & Freund, 2017; Qualter et al., 2015). These cognitions are considered to have the initial function of self-preservation and alleviation of loneliness, but to inversely result in increased anxiety, avoidance, weakened social initiative and thereby the stabilization of loneliness (Cacioppo et al., 2017; Nikitin & Freund, 2017; Qualter et al., 2015). In short, loneliness is considered to have the function of motivating adaptive change processes to prevent chronic loneliness but to also cause maladaptive cognitive dispositions that increase the risk of loneliness becoming chronic. This basic assumption is also common in recent biological and neuroscientific models of loneliness, such as the social-homeostasis model or the social-allostasis model (Matthews & Tye, 2019; Quadt et al., 2020). In accordance with the proposed negative effects loneliness has on cognition, a recent meta-analysis of interventions to reduce loneliness found that interventions that focus on changing maladaptive cognitions are the most effective (Masi et al., 2011). As loneliness does not only merely relate to the absence of social interactions and relationships, but to the perceived lack of quality, relevance and meaning of these interactions and relationships, this is already one way in which loneliness has been considered to be conceptually related to the perception and interpretation of meaning (Rosedale, 2007). Before delving into other ways in which loneliness is theoretically and empirically related to the perception of meaning in life, it is important to define what meaning is. To this end, the following section provides an overview of the definitions and evidence surrounding meaning.

Meaning in life and psychological well-being

As there can be different conceptualizations of meaning in life, this paragraph will provide a brief overview of common definitions of meaning in life. While there is no general consensus on the definition and conceptualization of meaning in life as a psychological concept, threefold conceptualizations of meaning in life have been proposed and adapted in research (Martela & Steger, 2022). These threefold conceptualizations are centered around the components coherence, purpose and significance (Costin & Vignoles, 2020; Martela & Steger, 2016). Coherence, which has also been defined as the *cognitive* component of meaning in life, refers to experiencing one's life as meaningful in the sense of being able to understand why and how things are ordered in the way they are (George & Park, 2016; Martela & Steger, 2016). The component significance is commonly referred to as the affective component of meaning

and is related to the evaluation of one's life as meaningful in the sense of it being worth living and being inherently valuable (Martela & Steger, 2016). The component purpose, considered to be a motivational component, is related to evaluating one's life as meaningful in the sense that it contains a meaningful direction, future-oriented aims and goals (George & Park, 2016; Martela & Steger, 2016). In current scientific practice, purpose is often used and operationalized interchangeably with the broader concept of meaning in life in research, and the two concepts have been shown to be related to similar health correlates (Czekierda et al., 2017; Sutin, Luchetti, Stephan, et al., 2022). Despite of this, purpose and meaning are considered to be related, yet conceptually distinct (George & Park, 2013). The structure of the relationship between the two concepts has been theorized to be that a sense of meaning is a prerequisite for the development of purpose, but that once purpose is developed, a sense of purpose also sustains a general sense of meaning (McKnight & Kashdan, 2009). While these differentiations within the broader concept of meaning are mainly theoretical, the relevance and value of research in clinical psychology on this topic lie mainly in the practical consequences that the perception or lack of meaning can have. Therefore, these practical consequences and relations are addressed in the following paragraph.

There is a rich evidence-base on the important role that the degree of meaning in life has for physical and mental health and well-being (Glaw et al., 2016). The relevance of meaning has widely been shown inversely by evidence of the relation of a lack or loss of meaning to overall psychopathology (e.g. depression or anxiety) and physiological illness (Dunn & O'Brien, 2009; Steger et al., 2009). Some of the positive aspects that a higher presence of perceived meaning has been associated with are higher self-esteem, higher positive affect, higher life satisfaction, better psychosocial health, better coping abilities and better adjustment to stress (Glaw et al., 2016). Accordingly, popular theories of psychological well-being in the field of positive psychology, such as the six-factor model developed by Ryff (1995), or the five-factor PERMA model by Seligman (2012) include the subjective evaluation of one's life possessing meaning and purpose as central factors.

Besides the empirical evidence, there are two main theoretical perspectives that could explain how meaning in life is linked to higher well-being. Firstly, theories such as the Meaning Maintenance Model by Heine et al. (2006) highlight the cognitive aspects of experiencing meaning and propose that it contains specific cognitive abilities and skills that make it directly beneficial to well-being. Secondly, meaning in life might be indirectly beneficial for well-being by strengthening other relevant psychological functions that lead to beneficial outcomes such as increased self-control and reduced impulsivity regarding thoughts, emotions and behaviors

(Li et al., 2019; MacKenzie & Baumeister, 2014). As meaning in life is a rather broad concept, the topic of valid and reliable measurement as a psychological construct is essential for high-quality research and will therefore briefly be addressed in the following paragraph.

Concerning the measurement of meaning in life, a systematic review by Brandstätter et al. (2012) identified 59 different measurement instruments all constructed to measure meaning in life. Around half of those instruments measured it as a unidimensional concept, and the rest used various multidimensional divisions, often only partially or not at all overlapping with the mentioned tripartite conceptualization (Brandstätter et al., 2012). The fact that none of the frequently applied measures of meaning in life differentiate between the three dimensions of coherence, significance and purpose is a shortcoming that is responsible for a lack of empirical data regarding these dimensions according to Martela and Steger (2016). Among the existing measures, one of the most widely used measure is the Meaning In Life Questionnaire (MLQ) developed by Steger et al. (2006a). The MLQ consists of two subscales, measuring the presence of meaning and the search for meaning (Steger et al., 2006a). Presence of meaning refers to the degree that a person perceives their life as meaningful in terms of coherence, significance, while search for meaning refers to the degree to which a person is engaged in the search for and acquisition of meaning (Steger et al., 2006a). The MLQ has been shown to a reliable and valid measure of meaning in life in various studies (Naghiyae et al., 2020; Negri et al., 2020; Semma et al., 2019). Now that both loneliness and meaning in life have been introduced conceptually and in their relation to well-being and health, the question how the two distinct concepts are related to each other remains to be answered. The following section will address the relationship between meaning and loneliness and present a recent hypothesis on three possible underlying mechanisms in that relationship.

The bidirectional relationship between meaning in life and loneliness.

While the detrimental effect that loneliness can have on individuals' sense of meaning and purpose in life has been established by earlier research, recent research has indicated this relationship seems to go both ways (Weziak-Bialowolska & Bialowolski, 2022). For example, a previous longitudinal study by Stavrova and Luhmann (2016) found higher perceived meaning in life to predict higher sense of social connectedness ten years later. In the context of the COVID-19 pandemic, Na et al. (2021) found that higher levels of pre-pandemic purpose in life were protective against the development of increased loneliness in military veterans over the course of a one-year period. Weziak-Bialowolska & Bialowolski (2022) also found that higher levels of meaning in life were associated with a reduced risk of suffering from loneliness six years later. The meta-analysis by Sutin et al. (2022) provided longitudinal evidence for a

protective relationship between purpose in life and loneliness, and thereby confirmed previous empirical research on the influence that meaning in life has on loneliness. Despite the initial evidence for a protective or buffering effect of meaning and purpose against loneliness, it remains an open question why this relationship exists and by which mechanisms it is enabled. The following paragraphs outline a recent hypothesis aiming to answer this question.

Folker et al. (2021) have recently proposed a hypothesis of three mechanisms that could explain a protective role of meaning in life against loneliness. The first potential mechanism they propose is that meaning is protective against loneliness through an increased positive orientation towards other people, which in turn influences the social behaviors and motivations of individuals favorably (Folker et al., 2021). The second mechanism that the authors proposed is that individuals with a high degree of perceived meaning in life are socially more attractive to others (Folker et al., 2021). The third proposed mechanism is that individuals with a high degree of meaning possess higher resilience and ability to cope with feelings of loneliness or loneliness-inducing situations. This third proposed mechanism is different from the others in the way that it does not relate to actual social arrangements or interactions that are preventive of loneliness, but to the resilience to loneliness and its relevance for the individual. While these proposed mechanisms are largely speculative, the following paragraphs address initial evidence on the way that meaning and loneliness are individually related to the three proposed mechanisms that can be interpreted to offer some plausibility to the hypothesis.

Concerning coping, previous research focusing on physical illnesses has indicated that meaning in life and purpose are associated to a higher stress-tolerance, healthier coping behaviors, self-efficacy, optimism and a higher ability to sustain healthy behaviors (Kim et al., 2019; Roepke et al., 2014; Steger et al., 2015). It is unclear to what extent these findings concerning physical health can be translated to the behavioral and psychological correlates of loneliness. However, previous research has shown coping to be related to loneliness in the way that problem-focused coping is related to a lower degree of loneliness and emotion-focused coping to a higher degree of loneliness (Deckx et al., 2018). Additionally, some researchers have proposed that there is a unique type of coping based on the appraisal of meaning and meaning-making that uses beliefs, values and existential goals to motivate healthy behavior, called meaning-focused coping (Folkman, 2008). Meaning-focused coping is theorized to be effective in coping with stressors (such as being alone) through cognitive reappraisal and psychological self-distancing that can put the stressor in a broader perspective and can infuse the situation with direction and positive meaning (Halama, 2014; Wang et al., 2019). Lastly, loneliness can also be considered to be conceptually related to coping if the evolutionary

perspective of loneliness as a stressor that is to be coped with or overcome is taken into account (Cacioppo et al., 2014; Goossens, 2018). Overall, it may be that a higher stress-tolerance, adaptive coping and a higher ability to sustain healthy behaviors are factors that are increased by meaning in life and in turn help people to deal with or prevent loneliness.

Concerning the proposed mechanism of attractiveness, previous experimental evidence has shown that people with a higher reported sense of meaning were rated as more desirable friends and conversation partners at first impression, with meaning being a stronger predictor than extraversion, self-esteem and happiness (Stillman et al., 2011). This effect was only significant for people who were rated low or average in physical attractiveness, as physically attractive individuals are socially appealing regardless of the level of meaning in life (Stillman et al., 2011). These findings are promising when considering that higher loneliness has previously been found to be related to lower rated physical attractiveness (Lamm & Stephan, 1987; Zakahi & Duran, 1988). In another study analyzing longitudinal data, higher baseline level of meaning in life predicted a higher chance of getting married in the future (Stavrova & Luhmann, 2016), which can be hypothesized to be partly due to attractiveness as well. It therefore appears plausible that there might be associations between meaning in life, loneliness, and socially appealing attributes, which renders the proposed mechanism of attractiveness worth assessing.

Lastly, concerning the proposed mechanism of a positive orientation towards others, recent longitudinal evidence suggests that a higher sense of meaning is related to an increased tendency to engage in prosocial behavior in the future (Zhang et al., 2022), while prosocial behavior is in turn related to increased perceived meaning (Van Tongeren et al., 2016). Loneliness has been shown to be negatively related to prosocial behavioral tendencies (Huang et al., 2016) as well as pro-social attitudes (Lay-Yee et al., 2022). These associations with prosocial tendencies and behaviors of both meaning in life and loneliness offer some plausibility to the hypothesis that a positive orientation towards others might also play a role in the relationship between meaning in life and loneliness.

Objective and relevance

Meaning in life seems to be a potentially promising target of intervention for the prevention and treatment of the major health issue loneliness. In the long-term, gaining more insights into the relationship between meaning in life and loneliness can contribute to the further development of clinical interventions to combat loneliness, since “if meaning in life protects against loneliness, interventions to prevent loneliness could also be premised on participants’ sources of meaning in life” (Folker et al., 2021, p. 473). Conducting more research

on the working mechanisms of this relationship (i.e. mediators) can further contribute to more tailored and effective interventions that focus, for example, on specific facets of meaning or specific facets of loneliness. In gaining a better understanding of the causality involved in the relationship it is also important to account for potential confounding factors that were not previously considered. Additionally, it is important to gain insight into specific circumstances or individual characteristics (i.e. moderators) that influence the relationship between loneliness and meaning in order to assess whether it is, for example, generalizable or specific to certain conditions or target groups. Since the current availability of sufficient and suitable research for a systematic review on the underlying and mediating factors of the relationship between meaning in life and loneliness is unclear to the author, an exploratory scoping review methodology is considered appropriate and needed. Scoping reviews are undertaken to identify and describe existing research in a certain area, identify significant ideas, and make clear aspects that are connected to those ideas (Arksey & O'Malley, 2005). In addition, scoping reviews can help in evaluating research gaps and can evaluate the necessity, relevance or feasibility of systematic literature reviews (Arksey & O'Malley, 2005). To contribute to this emerging field, this scoping review therefore assesses the current state of the art concerning the following main research question:

RQ: What is the existing evidence in relation to the hypothesized role of coping, positive orientation towards others and attractiveness in the relationship between meaning in life and loneliness?

This question is divided into two sub-questions:

SQ1: What are characteristics of studies focusing on the relation between MIL and loneliness (i.e., study designs, measurement instruments, target groups)?

SQ2: What are mediating and moderating factors found regarding the relationship of meaning in life and loneliness?

Methods

This study is structured according to the methodology of a scoping review. The “Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews” served as the orientation for the transparent reporting of the current scoping review (Tricco et al., 2018).

Search strategy and inclusion/exclusion criteria

The search for relevant publications was conducted in December 2022. The search was performed in three rounds starting with the database PsycInfo, to account for Psychology as the main discipline of interest. A second round was conducted in PubMed, to account for the

fact that research on loneliness as a public health issue might be published in journals focusing on medical disciplines. Web Of Science was used in a third round of the literature search to make use of its multi-disciplinary inventory. The main concepts for the search were Meaning in Life, Purpose in Life and Loneliness. However, to account for different usage of synonyms in the literature and to allow for broad study inclusion, synonyms, and bordering concepts to either loneliness or meaning in life were included in the search. The concepts of positive regard towards others, attractiveness and coping were not specifically included as search terms to allow for a broader inclusion of differently labeled mediator or moderator variables. The following search terms were applied to all of the included databases: (“Meaning In Life” OR “Personal Meaning” OR “Meaningful Life” OR "Search For Meaning" OR "Presence Of Meaning" OR "Purpose in Life" OR “Sense of Purpose” OR “Meaning Making”) AND (“Loneliness” OR “Lonely” OR "Social Isolation"). To narrow the focus on recent publications, the results were filtered to only include works published within the last ten years.

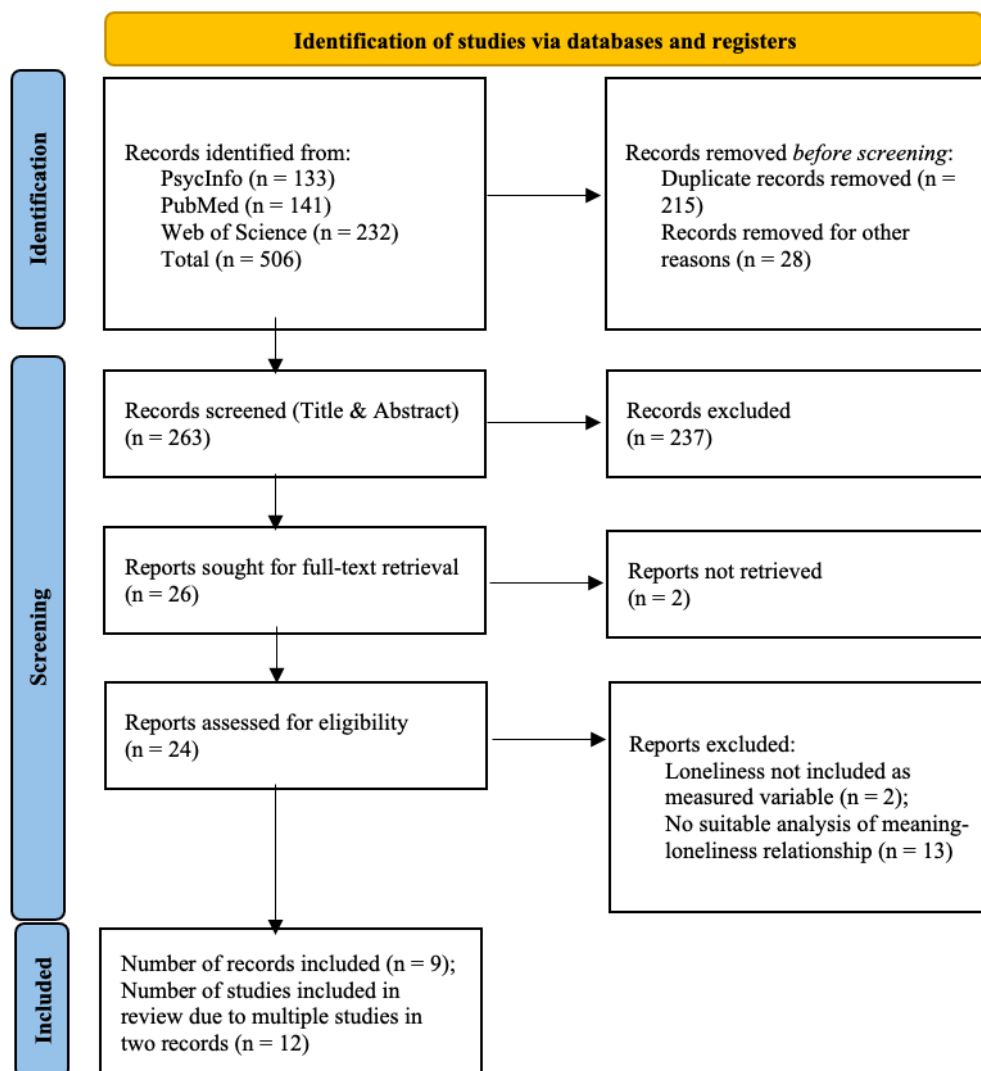
The main criteria for the inclusion of a study into the analysis were that (a) meaning in life or a closely related construct is measured and included as a variable; (b) loneliness or a closely related construct is measured and included as a variable; (c) the study includes an analyses of the relationship between meaning in life and loneliness; (b) the analyses includes at least one additional variable assessed in terms of a mediation or moderation effect. Studies were excluded if (a) The study did not analyze quantitative data; (b) no full-text was available or accessible in the German or English language; (c) the study was not published in a scientific journal or not peer-reviewed (such as a student paper or thesis). To document the selection process in a systematic and orderly manner, the software Zotero was used. A summary and visualization of the literature search and selection process can be found in Figure 1.

Data charting

The most important findings and characteristics of the screened and selected studies were summarized in tabular form, which was designed using the software Microsoft Word. The included records were screened in full length by the author. To gather the data relevant to the first sub-question, the articles were screened for their overall aim and design, the sample characteristics such as size, age and gender as well as the measurement instruments used. To gather relevant information concerning the second sub-question, the study results were scanned with regards to descriptive statistics, regression results as well as the results of mediation and moderation analyses. To increase the readability of the charted data, the information relating to the two sub-questions were listed in separate tables and sorted by mediation or moderation analyses as well as alphabetically.

Figure 1

PRISMA Flow-Chart summarizing the literature selection process



Results

Answering SQ1: Study characteristics

There were twelve studies included in the review in total. These twelve studies were found in nine records of which two (Abeyta & Juhl, 2022; Borawski et al., 2022) contained more than one study. As the studies taken from the same record each contain different combinations of samples, variables, and analyses, they were treated as distinct studies stemming from the same publication. The included studies have all been written in English and were published in scientific journals within the last six years, with publication dates ranging from 2017 to 2022. They were conducted in Poland, the United States, Turkey, and China. Most of the studies ($n = 11$) analyzed primary data, except for one study ($n = 1$) that analyzed

secondary data of a sample taken from an existing dataset. Table 1 lists the included studies, ordered alphabetically by the name of the authors, and provides an overview of the general study characteristics which will be described in the following paragraphs.

Study designs

Most included studies ($n = 11$) were cross-sectional in their study design, except for one (Abeyta & Juhl, 2022) that additionally incorporated an induced experimental condition and a control condition. Most of the studies ($n = 9$) operationalized loneliness as the predictor variable and meaning in life as the outcome variable, while the minority ($n = 3$) operationalized meaning in life as the predictor variable and loneliness as the outcome variable.

Measures of meaning and loneliness

Concerning the measurement and conceptualization of Meaning in Life, most studies ($n = 9$) used the original or translated versions of the Meaning in Life Questionnaire (Steger et al., 2006a). Other measures of meaning in life were the meaning subscale of the State Functions of Nostalgia Scale (Hepper et al., 2012), the meaning subscale of the Steen Happiness-Index (Seligman et al., 2005), the Purpose in Life subscale of the Psychological Well-being Scale (Ryff & Keyes, 1995) and the Chinese Personal Meaning Profile for children (Pan et al., 2008). Concerning the measurement of loneliness, half of the studies ($n = 6$) used the original or translated versions of the UCLA Loneliness Scale (Russell, 1996), making it the most frequently used loneliness measure in the sample of studies. Four studies used the original or translated versions of the De Jong Gierveld Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985). Other measures that were used in individual studies are a translated version of the Social and Emotional Loneliness Scale for Adults Short Form, with its three subscales addressing romantic, family and social loneliness (DiTommaso et al., 2004), and a translated version of the Loneliness Scale (Asher et al., 1984).

Sample characteristics

The age of participants across studies ranged from 6 to 109 years. Only one study (Du et al., 2017) intentionally included an adolescent population. The other studies characterized their participants either as adults or undergraduate students. The included studies contained samples living in Poland ($n = 6$), the United States ($n = 2$), Turkey ($n = 1$), China ($n = 1$) or did not explicitly name the nationality or place of residency of their sample ($n = 2$). Overall, samples contained a majority of female participants, with the proportion of females ranging from 42.65% to 80.7%, with a median of 70.49% (mean of 68.39%). The sample sizes ranged from 206 to 11213 participants with a median of 360.5 (mean of $M = 1319.5$), resulting in a combined sample size of 15834 participants included in this review.

Statistical methods used to assess moderation and mediation

The majority of included studies ($n = 9$) performed a moderation analysis, a minority of studies performed a mediation analysis ($n = 2$) and one study ($n = 1$) performed both a mediation and a moderation analysis. For the moderation analysis, most studies ($n = 6$) reported that Model 1 of the PROCESS macro for SPSS by Hayes (2018) was used. The other studies reported to have applied a hierarchical regression analysis ($n = 1$), a moderated regression analysis ($n = 1$) and a multiple regression ($n = 1$). Additional methods reported by some studies were the Johnson and Neyman technique ($n = 3$) and the bootstrapping method ($n = 4$). A minority of studies included covariates such as participant demographics in their moderation analysis ($n = 3$). Among the studies that performed a mediation analysis, all made use of the PROCESS macro for SPSS by Hayes (2018), such as Model 4 (mediation analysis) and Model 14 (moderated mediation analysis). Two of the studies additionally reported the use of the bootstrapping method and one study included participants' sex as a covariate.

Mediating or moderating factors

Concerning the specific factors that were assessed as potential moderators or mediators, the studies contained nine different factors in total. Of these nine factors, six were assessed as potential moderators, namely nostalgia (Abeyta & Juhl, 2022), search for meaning (Borawski et al., 2022), religiosity (Chan et al., 2018), reflection (Borawski, 2022a), resilience (Du et al., 2017), and presence of meaning (Zeligman et al., 2019). In addition, two factors were assessed as potential mediators, namely positive orientation (Borawski, 2022b) and religious coping (Yildirim et al., 2021). Lastly, the factor mindfulness was assessed as both a potential mediator as well as a potential moderator (Borawski et al., 2021). The following paragraphs will summarize the study findings concerning each factor, beginning with the factors tested for moderation, followed by the factors tested for mediation. For a summarized and brief overview of these results, see Table 2.

Table 1*Characteristics of included studies*

	Authors (Year)	Study Focus	Study Design	Sample Information	MIL measure	Loneliness Measure
				Moderation		
1	Abeyta & Juhl (2022)	Study 1: State nostalgia as a moderator of the relationship between trait loneliness and state meaning in life.	Cross-Sectional	Undergraduate Students ($n = 210$); Age ($M = 19.78$, $SD = 3.78$); 70.48% Female.	State-version of MLQ (Steger et al., 2006a); $\alpha = .84$)	UCLA Loneliness Questionnaire (Russell, 1996); $\alpha = .84$
2		Study 2: Experimentally induced state nostalgia as a moderator of the relationship between trait loneliness and state meaning in life.	Experimental	Undergraduate Students ($n = 229$); Age ($M = 19.83$, $SD = 4.29$); 79.91% Female.	Meaning subscale of State Functions of Nostalgia scale (Hepper et al., 2012); $\alpha = .84$)	UCLA Loneliness Questionnaire (Russell, 1996); $\alpha = .84$
3	Borawski (2022)	Reflection as a moderator of the relationship between	Cross-Sectional	Polish adults ($n = 269$); Age range 19 - 45 ($M = 25.65$, $SD = 6.07$); 64.68% Female.	Polish version of Presence subscale of MLQ (Kossakowska et al., 2013);	Polish version of De Jong Gierveld Loneliness Scale (de Jong-Gierveld &

Authors (Year)	Study Focus	Study Design	Sample Information	MIL measure	Loneliness Measure	
	loneliness and meaning in life.			$\alpha = .82$; Polish version of Meaning subscale of the Steen Happiness Index (Kaczmarek et al., 2010; M. E. P. Seligman et al., 2005); $\alpha = .74$	Kamphuls, 1985); $\alpha =$.87	
4	Borawski, Nowak & Zakrzewska (2022)	Study 1: Search for meaning as a moderator of the relationship between general loneliness and meaning in life.	Cross- Sectional	Polish Adults ($n = 563$); Age range 19 – 74 ($M =$ 27.46, $SD = 8.99$); 70.5 % Female.	Polish version of MLQ (Kossakowska et al., 2013; Steger et al., 2006b); Presence subscale $\alpha = .89$; Search subscale $\alpha =$.77	Polish version of the De Jong Gierveld Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985); $\alpha =$.87
5		Study 2: Search for meaning as a moderator of the relationship between general	Cross- Sectional	Polish Adults ($n = 306$); Age range 18 – 63 ($M =$ 24.24, $SD = 6.87$); 80.7% Female.	Polish version of MLQ (Kossakowska et al., 2013; Steger et al., 2006b)	Polish version of the Revised UCLA Loneliness Scale

Authors (Year)	Study Focus	Study Design	Sample Information	MIL measure	Loneliness Measure	
	loneliness and meaning in life during the Covid- Pandemic.			Presence subscale α = .90; Search subscale α = .78	(Russell, 1996); α = .93	
6	Study 3: Search for meaning as a moderator of the relationship between domain- specific loneliness (e.g. romantic, family) and meaning in life during the Covid-Pandemic.	Cross- Sectional	Polish Adults ($n = 206$); Age range 18 – 48 ($M =$ 26.04, $SD = 5.6$); 80.1% Female.	Polish version of MLQ (Steger et al. 2006, Kossakowska et al. (Kossakowska et al., 2013); Presence subscale α = .92; Search subscales $\alpha = .71$)	Polish version of the Social and Emotional Loneliness Scale for Adults Short Form (SELSA-S; Romantic subscales $\alpha = .87$; Family subscales $\alpha =$.89; Social subscales α = .89)	
7	Chan et al. (2018)	(Study 1) Religiosity as a moderator of the relationship between loneliness and purpose in life.	Cross- Sectional	American Adults ($n =$ 11213); Age range 28 – 109 (M = 65.76; $SD = 11.91$); 57.97% Female.	Purpose in Life Scale (Ryff & Keyes, 1995); $\alpha = .78$	UCLA Loneliness- Scale (Russell, 1996) ; $\alpha = .89$

	Authors (Year)	Study Focus	Study Design	Sample Information	MIL measure	Loneliness Measure
8	Du et al. (2017)	Resilience as a moderator of the relationship between loneliness and meaning in life.	Cross- Sectional	Chinese children and adolescents affected by parental HIV ($n = 626$); Age range 6 – 17 ($M = 12$; $SD = 2.49$); 42.65% Female.	Chinese Personal Meaning Profile for children (Pan et al., 2008); $\alpha = .95$	Loneliness Scale (Asher et al., 1984); $\alpha = .79$
9	Zeligman et al. (2019)	Presence of meaning as a moderator of the relationship between search for meaning and loneliness in college students who have experienced trauma.	Cross- Sectional	Undergraduate students at a US university ($n = 621$); Age range 18 – 60 ($M = 23.5$; $SD = 5.33$); 58.4% Female.	MLQ (Steger et al., 2006b); full scale $\alpha = .78$; presence subscale $\alpha = .89$; search subscale $\alpha = .92$	UCLA Loneliness Scale (Russell, 1996); $\alpha = .92$
Mediation						
10	Borawski (2022)	Positive Orientation as a mediator of the relationship between loneliness and meaning in life.	Cross- Sectional	Polish adults ($n = 304$); Age range 19 – 45 ($M = 25.61$; $SD = 6.1$); 65.5% Female	Presence of meaning subscale of MLQ (Steger et al. 2006)	Polish version of the De Jong Gierveld Loneliness Scale (de Jong-Gierveld &

Authors (Year)	Study Focus	Study Design	Sample Information	MIL measure	Loneliness Measure	
					Kamphuls, 1985; Grygiel et al., 2013)	
11	Borawski et al. (2021)	Mindfulness as a mediator of the relationship between loneliness and meaning in life; search for meaning as a moderator of the mediation effect of mindfulness.	Cross-Sectional	Polish Adults ($n = 415$); Age range 18 – 55 ($M = 27.88$; $SD = 8.66$); 77.59% Female.	Polish version of the MLQ (Kossakowska et al., 2013; Steger et al., 2006b) ; Presence subscale $\alpha = .88$; Search subscale $\alpha = .82$	Polish version of the De Jong Gierveld Loneliness Scale (de Jong-Gierveld & Kamphuls, 1985; Grygiel et al., 2013); $\alpha = .89$
12	Yildirim et al. (2021)	Religious coping as a mediator of the relationship between meaning in life and loneliness.	Cross-Sectional	Turkish adults ($n = 872$); no details on age provided; 72.2% Female.	Turkish version of the MLQ (Boyras et al., 2013; Steger et al., 2006b); $\alpha = .84$	Turkish version of the revised UCLA Loneliness Scale (Demir, 1989; Russell, 1996); $\alpha = .75$

Note. DV = Dependent Variable, IV = Independent Variable, MIL = Meaning in Life, MLQ = Meaning in Life Questionnaire, UCLA = University California Los Angeles

Answering SQ2: Study results

Across all the included studies, bivariate correlations consistently showed significant negative relations between loneliness and the presence or experience of meaning in life. The strength of these negative correlations ranged from $r = -.23$ (Study 6) to $r = -.55$ (Study 9), with a median correlation of $r = -.38$ across all included studies. Concerning the relation between loneliness and search for meaning, the studies that included a measure of search for meaning ($n = 6$) showed only partially significant negative bivariate correlations, ranging from $r = -.02$ (Study 5) to $r = -.09$ (Study 9) and a median correlation of $r = -.07$. Similarly, regression results consistently showed significant negative standardized coefficients both with loneliness as the predictor (ranging from $\beta = -.14$ to $-.43$; median coefficient of $\beta = -.36$) and with meaning in life as the predictor (ranging from $\beta = -.20$ to $\beta = -.53$; median coefficient of $\beta = -.21$).

Concerning the mediation and moderation analyses included in the reviewed studies, there were nine different concepts that were assessed as moderators or mediators of the relationship between meaning in life and loneliness, of which one was assessed as both a moderator and a mediator. Religiosity, search for meaning, reflection and nostalgia each showed significant moderation effects on the relationship between loneliness, while mindfulness did not show a significant moderation effect. These moderators influenced the relationship between loneliness and meaning in life in the way that the higher the score of the moderator was, the weaker the negative loneliness-meaning relation. Resilience was also found to have a significant but opposite moderation effect, as the moderation was such that the negative relation between meaning in life and loneliness was only present at high resilience. In other words, the higher resilience, the stronger the negative relation. Presence of meaning did not show a significant moderation effect on the relationship between search for meaning and loneliness. Lastly, religious coping, positive orientation and mindfulness were found to have significant partial mediation effects on the relationship between loneliness and meaning in life. However, the partial mediation effect of mindfulness was only significant at medium to high levels of search for meaning. The following paragraphs lay out these results per mediator or moderator in detail, while the significant mediation and moderation effects that were found in the reviewed studies are summarized visually in Figure 2 and Figure 3.

Moderation

Nostalgia. Study 1 by Abeyta & Juhl (2022) found that state nostalgia was positively related with meaning in life in their sample ($b = .18$, $SE = .07$, $\beta = .17$, $t = 2.46$, $p = .015$). The

authors additionally found a significant interaction effect between loneliness and state nostalgia on meaning in life ($b = .30$, $SE = .14$, $t = 2.18$, $p = .03$). The negative relation between loneliness and meaning in life was less strong with a higher degree of state nostalgia, and non-significant at a high level of nostalgia (1.46 SD above mean). Additionally, the positive relation between nostalgia and meaning in life was stronger in persons with higher loneliness. Similar results were found concerning experimentally induced nostalgia in Study 2 by Abeyta & Juhl (2022), in which there was a significant interaction effect between nostalgia and loneliness on meaning in life ($b = .44$, $SE = .16$, $t = 2.86$, $p = .005$, 95% CI [.14, .75]), and experimentally induced nostalgia was more strongly positively related to meaning in people with higher loneliness. The negative relation between loneliness and meaning was found to be weaker in the experimental condition ($b = -.34$, $SE = .11$, $t = -3.09$, $p = .002$, 95% CI [-.56, -.12]) than in the control condition ($b = -.78$, $SE = .11$, $t = -7.20$, $p < .001$, 95% CI [-1.00, -.57]). Taken together, these two studies indicated a significant moderation effect of nostalgia on the relation between loneliness and meaning in life. Depending on the assumed causality involved, nostalgia either dampened the negative effect of loneliness on meaning or dampened the protective effect of meaning on loneliness.

Reflection. The potential moderating effect of reflection on the relationship between loneliness and meaning in life was evaluated in Study 3 by Borawski (2022a). Meaning in life was measured both in terms of presence of meaning and in terms of recent meaningful moments. The results concerning both measures showed significant interaction effect of reflection and loneliness on both presence of meaning ($\beta = .13$, $SE = .11$, $p = .02$, 95% CI [.04, .48]) as well as recent meaningful experiences ($\beta = .15$, $SE = .07$, $p = .009$, 95% CI [.05, .31]). For both measures, the negative relation between loneliness and meaning was stronger at low reflection levels, weaker at increasing reflection levels, to the point of being insignificant at high levels of reflection (for presence of meaning: reflection >1.5 SD above mean; for recent meaningful experiences: reflection >1.3 SD above mean). These results indicated a moderating effect of reflection on the relation between loneliness and meaning in life, such that the higher a person's level of reflection was, the weaker the negative relation between loneliness and meaning. Depending on the assumed causality involved, reflection either dampened the negative effect of loneliness on meaning or dampened the protective effect of meaning on loneliness.

Search for meaning. Study 4 by Borawski et al. (2022) found a significant interaction effect of loneliness and search for meaning on presence of meaning ($b = .12$, $SE = .06$, $p = .04$,

95% CI [.01, .24]), indicating a partial moderation effect of search for meaning. Furthermore, the effect strength that loneliness had on presence of meaning decreased with rising levels of search for meaning, being lowest at +1 *SD* search for meaning ($b = -.56$, $SE = .09$, $p < .001$) and highest at -1 *SD* search for meaning ($b = -.81$, $SE = .09$, $p < .001$). In other words, loneliness had a less negative relation to the sense of meaning in people with a higher degree of search for meaning in Study 4. The results of Study 5 by Borawski et al. (2022) are similar in that a significant interaction effect between loneliness and search for meaning on presence of meaning was found, also indicating a partial moderation effect ($b = .32$, $SE = .10$, $p = .002$, 95% CI [.12, .52]). This study also found that the strength of the negative relation between loneliness and presence of meaning depended on search for meaning during the Covid-19 pandemic. While this relation was strongest for participants with low (-1 *SD* below mean) search for meaning ($b = -1.54$, $SE = .18$, $p < .001$), it was the weakest at high (+1 *SD* above mean) search for meaning ($b = -.74$, $SE = .18$, $p < .001$). In other words, the higher a participant's degree of search for meaning was, the weaker the negative relation between loneliness and presence of meaning was. Study 6 by Borawski et al. (2022) measured three dimensions of loneliness and also found significant interactive effects of search for meaning and all three dimensions of loneliness on presence of meaning: romantic loneliness ($b = .11$, $SE = .05$, $p = .02$), family loneliness ($b = .14$, $SE = .06$, $p = .03$) and social loneliness ($b = .13$, $SE = .05$, $p = .01$). Across the three types of loneliness, the effect strength of loneliness on presence of life decreased with higher levels of search for meaning. In the case of romantic loneliness, the negative relation between loneliness and presence of meaning was even neutralized at high search for meaning (+1 *SD* above mean). Taking the three studies together, the results indicate a moderating effect of search for meaning in the way that people with a higher in search for meaning displayed weaker negative effects of loneliness on their sense of meaning.

Religiosity. Study 7 by Chan et al. (2018) assessed the potential moderating effect of religiosity on the relationship between loneliness and purpose in life. It was found that there was a significant interaction effect of religiosity and loneliness ($b = .07$, $SE = .03$, $p = .01$, CI [0.02, 0.13]). The negative relation between loneliness and purpose in life was found to be stronger for persons low in religiosity (-1 *SD* below mean; $b = -0.96$, $SE b = 0.05$, $t = -17.53$, $p < 0.001$) and weaker for persons high in religiosity (+1 *SD* above mean; $b = -0.75$, $SE b = 0.06$, $t = -11.69$, $p < 0.001$). Therefore, the results indicated a moderation effect of religiosity on the relationship between loneliness and purpose in life in the way that the negative meaning-

loneliness relation was weaker at lower religiosity, and the other way around. Depending on which causality in the negative meaning-loneliness relation is assumed, religiosity might either have dampened the harmful effect of loneliness on meaning in life or dampened the protective effect of meaning in life against feeling lonely. Either way, religiosity appears to increase the degree of independence between the two main variables.

Resilience. The potential moderation effect of resilience on the relationship between meaning in life and loneliness was assessed in Study 8 by Du et al. (2017). The results showed that there was a significant interaction effect between meaning in life and resilience on loneliness ($b = -.13, p < .01$). A significant negative relation between meaning in life and loneliness was only present for participants high in resilience (+1 SD above mean, $b = -0.20, p < .001$), but not for participants low in resilience (-1 SD below mean, $b = -0.08, p = .10$), indicating that higher meaning in life was only predictive of lower loneliness for people with high resilience. Overall, the results indicated a significant moderation effect of resilience in the way that the negative relation between loneliness and meaning was only present at high levels of resilience. This finding indicates that a potential effect of meaning in life as a protective factor against loneliness would be dependent on the individual level of resilience.

Presence of meaning. Presence of meaning was assessed as a potential moderator on the relation between loneliness and search for meaning in Study 9 by Zeligman et al. (2019). The results showed that there was no evidence for a significant moderation effect of presence of meaning on this relationship ($b = .01, t = 1.11, p = .27$).

Mindfulness. Study 11 by Borawski et al. (2021) did not find a significant interaction effect of mindfulness and loneliness on POM ($b = -0.10, SE = 0.09, 95\% CI [-0.28, 0.08], p = .28$). Mindfulness was negatively related to loneliness ($b = -0.32, SE = 0.04, p < .001$) and positively related to presence of meaning ($b = 0.43, SE = 0.08, p < .001$). The study did not produce evidence for a moderation effect of mindfulness on the relationship between loneliness and mindfulness.

Mediation

Positive Orientation. A potential mediation effect of positive orientation was assessed by a single study included in the review, namely Study 10 by Borawski (2022b). The results of this study showed that positive orientation was negatively related to loneliness ($b = -.34, SE = .04, p < .001$) and positively related to meaning in life in terms of presence of meaning ($b = 0.84, SE = 0.10, p < 0.001$). Additionally, a significant indirect effect of loneliness on meaning in life via positive orientation was found ($b = -0.28, SE = 0.05, 95\% CI = [-0.39, -0.19]$)

while direct effect of loneliness on meaning remained significant ($b = -0.30$, $SE = 0.08$, $p < 0.001$). The indirect effect accounted for 48.94% of the total effect. Therefore, Study 10 indicated that the relationship between loneliness and meaning in life was partially mediated by positive orientation towards oneself, one's future and one's life.

Mindfulness. Study 11 by Borawski et al. (2021) found mindfulness to be negatively related to loneliness ($b = -0.32$, $SE = 0.04$, $p < .001$) and positively related to presence of meaning ($b = 0.43$, $SE = 0.08$, $p < .001$). Additionally, it was found that loneliness had a significant indirect effect on presence of meaning via mindfulness ($b = -0.14$, $SE = 0.03$, 95% CI $[-0.21, -0.08]$), while the direct effect of loneliness remained significant ($b = -0.62$, $SE = 0.08$, $p < .001$), indicating that the loneliness-meaning relationship was partially mediated by mindfulness to an extent of 18.1%. A further analysis of this mediation effect indicated a moderated mediation by search for meaning, since the mediation effect of mindfulness showed to be only significant at medium (mean) and high levels (≥ 1 SD above mean) of search for meaning.

Religious Coping. Religious coping (divided into positive and negative religious coping) was assessed as a potential mediator in Study 12 by Yildirim et al. (2021). Concerning the direct effect of religious coping on loneliness, it was found that there was a significant negative effect of positive religious coping ($b = -.12$, $p < .001$) and a significant positive effect of negative religious coping ($b = .23$, $p < .001$) on loneliness. Concerning the mediation effect, meaning in life showed to have significant indirect effect on loneliness via positive religious coping ($\beta = -.05$, $SE = .02$, CI $[-.17, -.08]$) and via negative religious coping ($\beta = .07$, $SE = .01$, CI $[-.10, -.05]$) on loneliness (total indirect effect: $\beta = -.12$, $SE = .02$, CI $[-.17, -.08]$; $R^2 = .18$, $F = 61.93$, $p < 0.001$). Therefore, religious coping partially mediated the relationship between meaning in life and loneliness.

Answering the main research question

Based on the reviewed studies, no evidence concerning the role of attractiveness or positive orientation towards others could be extracted beyond speculation. However, the results are partially compatible with the hypothesis in the way that aspects closely related to coping seem to play a role both in terms of underlying mechanisms in the relation between meaning in life and loneliness, as well as in terms of individual dispositions and conditions that determine the strength of the negative meaning-loneliness relation. Specifically, the hypothesized negative effects of meaning on loneliness were mediated by religious coping, mindfulness and positive orientation. Most moderators that showed significant effects

(religiosity, search for meaning, nostalgia, reflection) weakened the negative meaning-loneliness relation, while only resilience strengthened it. Based on these results, the current state of evidence regarding the role of coping, attractiveness, and positive orientation towards others in the relationship between loneliness and meaning in life thus presented itself to be severely limited yet promising with regards to the role of coping-related variables.

Figure 2

Visualization of moderating and mediating effects found in studies that hypothesized the bivariate relation as an effect of loneliness on meaning

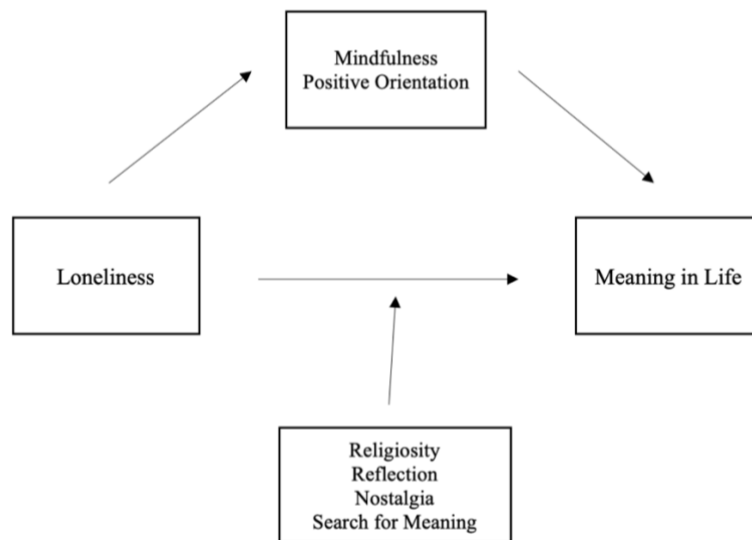


Figure 3

Visualization of moderating and mediating effects found in studies that hypothesized the bivariate relation as an effect of meaning on loneliness

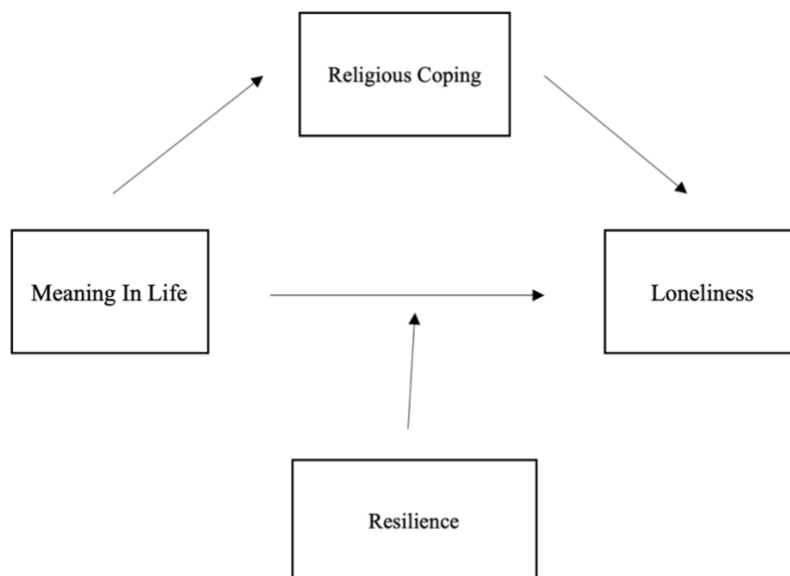


Table 2*Study results regarding moderating or mediating factors of the loneliness-meaning relationship*

Authors (Year)	Mediator or moderator assessed	Type of Analysis	Bivariate Correlations	Mediation/Moderation results
Moderation				
1	Abeyta & Juhl (2022)	State Nostalgia, measured with the Nostalgia Inventory (Batcho, 1995); $\alpha = .90$	Regression using PROCESS Model 1 in SPSS (Hayes, 2018) and Johnson and Neyman technique	$r = -.38, p < .001$; Significant moderation effect. The higher nostalgia, the weaker the negative loneliness-meaning relation.
2		Experimentally induced nostalgia using Event Reflection Task (Sedikides & Wildschut, 2022)	Moderation analysis using PROCESS macro Model 1 in SPSS (Hayes, 2018) and Johnson and Neyman technique	$r = -.43, p < .001$; Significant moderation effect. The higher nostalgia, the weaker the negative loneliness-meaning relation.
3	Borawski (2022)	Reflection, measured with the Rumination-Reflection Questionnaire-Short Form (Słowińska et al., 2014)	Multiple regression, simple slope tests, Johnson-Neyman technique; Rumination as covariate.	POM: $r = -.37, p < .001$ RME: $r = -.33, p < .001$ Significant moderation effect. The higher reflection, the lower the negative loneliness-meaning relation.

	Authors (Year)	Mediator or moderator assessed	Type of Analysis	Bivariate Correlations	Mediation/Moderation results
4	Borawski, Nowak & Zakrzewska (2022)	Search for meaning, measured with MLQ (Steger et al., 2006b)	Moderation analysis using PROCESS 3.4 Model 1 in SPSS (Hayes, 2018) with bootstrapping method (bias-corrected confidence estimates, 10000 bootstrapped resamples)	POM: $r = -.45, p < .001$; SFM: $r = -.07$	Significant moderation effect. The higher SFM, the lower the negative loneliness-meaning relation.
5		Search for meaning, measured with MLQ (Steger et al., 2006b)	Moderation analysis using PROCESS 3.4 Model 1 in SPSS (Hayes, 2018) with bootstrapping method (bias-corrected confidence estimates, 10000 bootstrapped resamples)	POM: $r = -.44, p < .001$; SFM: $r = -.02$	Significant moderation effect. The higher SFM, the lower the negative loneliness-meaning relation.
6		Search for meaning, measured with MLQ (Steger et al., 2006b)	Moderation analysis using PROCESS 3.4 Model 1 in SPSS (Hayes, 2018) with bootstrapping method (bias-corrected confidence estimates, 10000 bootstrapped resamples)	POM: Romantic loneliness: $r = -.23, p < .001$; Family loneliness: $r = -.37, p < .001$; Social loneliness: $r = -.40, p < .001$;	Significant moderation effect for all three types of loneliness. The higher SFM, the lower the negative meaning-loneliness relation.

Authors (Year)	Mediator or moderator assessed	Type of Analysis	Bivariate Correlations	Mediation/Moderation results
			SFM: Romantic loneliness: $r = .08$; Family loneliness: $r = -.07$; Social loneliness: $r = -.07$;	Negative relation between romantic loneliness and POM neutralized at high SFM.
7 (2018)	Chan et al. Religiosity, measured with an adaption of the Brief Multidimensional Measure of Religiosity/Spirituality (Stewart & Koeske, 2006)	Moderated regression analysis with loneliness and religiosity as primary predictors, controlled for participant demographics as covariates.	$r = -.45, p < .01$	Significant moderation effect. The higher religiosity, the weaker the negative relation between loneliness and purpose.
8 (2017)	Du et al. Resilience, measured with the Connor- Davidson Resilience Scale (Connor & Davidson, 2003)	Hierarchical regression analysis, using gender and age as covariates;	$r = -.29, p < .001$	Significant moderation effect. Negative relation between meaning in life and loneliness was only present in participants high in resilience.

Authors (Year)	Mediator or moderator assessed	Type of Analysis	Bivariate Correlations	Mediation/Moderation results
9 Zeligman et al. (2019)	Presence of meaning (on search for meaning – loneliness relationship)	Moderation analysis using Model 1 of PROCESS macro for SPSS 24.0 (Hayes, 2018);	POM: $r = -.55, p < .001$; SFM: $r = -.09, p < .001$;	No significant moderation effect.
Mediation				
10 Borawski (2022)	Positive Orientation (POS) measured with the Positivity Scale (Caprara et al., 2012)	Mediation analysis using PROCESS macro in SPSS (Hayes, 2018) with bootstrapping method (bias-corrected confidence estimates, 10000 bootstrapped resamples), participant sex included as covariates	$r = -.37, p < .001$	Significant partial mediation effect.
11 Borawski et al. (2021)	Mindfulness, measured with Mindful Attention Awareness Scale (Brown & Ryan, 2003)	Mediation analysis using PROCESS macro Model 4, Moderation analysis using the PROCESS macro Model 1 in SPSS Moderated mediation analysis using PROCESS macro Model 14 (Hayes, 2018);	POM: $r = -.45, p < .001$; SFM: $r = -.06$	No significant moderation effect. Significant mediation effect. Partial mediation effect only significant at medium and high levels of SFM.

Authors (Year)	Mediator or moderator assessed	Type of Analysis	Bivariate Correlations	Mediation/Moderation results
12	Yildirim et al. (2021)	Religious Coping (divided into positive and negative religious coping), measured using the Religious Coping Scale (Aytan, 2012)	Sex and age as covariates. Mediation analysis using PROCESS macro 3.5 Model 4 in SPSS (Hayes, 2018); Bootstrapping method with 10000 resamples to assess significance of effects;	$r = -.33, p < .001$; Significant partial mediation effects via positive religious coping and negative religious coping.

Note. POM = Presence of meaning, SFM = Search for meaning, POS = Positive Orientation

Discussion

The overall aim of this scoping review was to generate new insights on the relationship between the experience of meaning in life and the experience of loneliness. Specifically, the current state of evidence on the relation between meaning in life and loneliness was assessed with regards to a recent hypothesis which proposed coping, positive regard towards others and attractiveness to be underlying mechanisms of a protective effect of meaning in life. To assess the state of evidence concerning this hypothesis, a systematic literature search of recent quantitative studies on the relationship between meaning in life and loneliness was conducted in scientific databases, with a focus on studies that included an analysis of mediating or moderating factors of that relationship. The search resulted in 12 studies that were analyzed regarding their general study characteristics and their results concerning the bivariate relations and the tested mediation or moderation effects. This section critically assesses and contextualizes the main findings in relation to previous theoretical and empirical literature, discusses the limitations of this research and offers recommendations for future research.

Main findings

Concerning the direct relationship between meaning in life and loneliness, the first main finding was that all of the included studies found the two concepts to be significantly negatively related to each other in terms of bivariate correlations as well as regression coefficients with small to medium effect sizes (Abeyta & Juhl, 2022; Borawski, 2022a, 2022b; Borawski et al., 2021, 2022; Chan et al., 2018; Du et al., 2017; Yildirim et al., 2021; Zeligman et al., 2019). This finding is generally in line with previous research that found loneliness and meaning to be related (Folker et al., 2021). Unfortunately, the findings do not allow for the conclusive inference of causality given the cross-sectional nature of the data. On the one hand, the fact that the studies consistently showed negative relations can be interpreted as being in line with previous findings on the detrimental effect loneliness has on the perception of meaning (Mwilambwe-Tshilobo et al., 2019). On the other hand, it can also be interpreted as being in line with previous research proposing a buffering effect of meaning in life against loneliness (Folker et al., 2021; Macia et al., 2021). Therefore, the findings leave interpretive ambiguity regarding the existence of a bidirectional relationship between the two variables and the proposed protective effect of meaning against loneliness that would be similar to the protective effect of purpose in life (Sutin et al., 2022). The result that purpose in life and meaning in life were related to loneliness with similar strengths further speaks in favor of a comparable effect of meaning and purpose.

Concerning the hypothesized role that coping, positive orientation towards others and attractiveness have as underlying mechanisms in this potentially bidirectional relationship, the second main finding was that religious coping, mindfulness, and positive orientation (towards oneself, one's life and one's future) were assessed as mediators and showed significant partial mediation effects. Importantly, all these variables refer to cognitive dispositions, interpretations or evaluations that are either directly related to aspects of coping or are psychological resources beneficial to coping with stressors (de Vibe et al., 2018; Krägeloh et al., 2012; Lara et al., 2013). The partial mediation effects are therefore in line with previous theoretical considerations on the benefits of meaning-focused coping, which is theorized to be effective in coping with stressors (such as being alone) through cognitive reappraisal and psychological self-distancing that can put the stressor in a broader perspective and can infuse the situation with direction and positive meaning (Halama, 2014; Wang et al., 2019). The specific mediation of religious coping can also be interpreted to be in line with the meaning-maintenance model by Heine et al. (2006), which assumes that a threat to one domain of meaning (e.g. social life) is commonly coped with by shifting attention to other sources of meaning (e.g. spirituality). However, this meaning-maintenance perspective also fits in the broader theory of meaning-focused coping in terms of cognitive reappraisal of the stressor in a broader perspective.

The third main finding was that resilience, religiosity, reflection, presence of meaning, nostalgia, mindfulness, and search for meaning were assessed as moderators, of which all except for presence of meaning and mindfulness showed significant moderation effects of the loneliness-meaning relation. Religiosity, reflection, nostalgia and search for meaning showed moderation effects in the way that the higher the moderator was, the weaker the negative loneliness-meaning relation was. When assuming the causality of a negative effect of meaning on loneliness, this would mean that people low in these beneficial moderators would exhibit a stronger effect of meaning. Since these moderators have in common that they contain processes of cognitive appraisal and interpretation, they might have properties closely related to meaning-making and meaning-based coping that make them protective against a loss of meaning caused by loneliness (Halama, 2014; Wang et al., 2019). In fact, all of those moderators have been previously linked to meaning-making conceptually and empirically in previous research (Lee, 2008; Palacios et al., 2021; Park, 2016; Routledge et al., 2012). Therefore, it is possible that the sense of meaning in people with higher baseline levels of these moderators would be less affected by loneliness because of the inherent meaning-making properties of religiosity, reflection, nostalgia and search for meaning. Another possibility is that people high in these

moderators have more other advantageous dispositions that lead to lower psychological distress, as all of the beforementioned have previously been linked with mental health benefits (Batcho, 2013; Reynolds et al., 2022; Rote et al., 2013; Wildschut et al., 2006). This would be in line with previous meta-analytic evidence that found the relationship between purpose and loneliness to be weaker in people with lower overall psychological distress and stronger in people with higher distress (Sutin, Luchetti, Aschwanden, et al., 2022). Both of these possibilities would mean that those moderators are resources with protective effects, leaving people without them especially affected by the meaning-loneliness relationship, regardless of the assumed causality. Inconsistent with these findings, resilience showed the opposite moderation effect, namely that the negative meaning-loneliness relation was stronger at higher resilience and weaker at lower resilience. This adds to recent findings in the way that while meaning in life is predictive of the level of resilience in adults (Karataş & Tagay, 2021), meaning might also require a higher level of resilience to act as a protective factor against loneliness. Resilience is partly characterized by the ability to be able to adaptively cope with stressors and adapt to change and is therefore closely related to the overarching concept of coping (Fung, 2020). As resilience has also been shown to be related to more problem-focused coping styles (Campbell-Sills et al., 2006; Lee et al., 2017; Liang et al., 2020), these findings indicate that increased resilience, and thereby an increased ability of problem-focused coping, might be required for a stronger negative effect of meaning on loneliness.

The fourth main finding was that none of the included studies included any measure of interpersonal attractiveness or the positive regard towards others and therefore offered no data to assess regarding these variables. On the one hand, the lack of evidence concerning the positive regard towards others can be considered surprising, since previous research on loneliness highlighted the importance of social cognition (Masi et al., 2011). On the other hand, the lack of evidence concerning the role of attractiveness can be interpreted as being in line with the fact that previous research commonly considered the benefits of meaning in life to be mainly related to changes in individual cognitive and affective processes rather than to any interpersonal aspects (Heine et al., 2006; MacKenzie & Baumeister, 2014). This absence of evidence makes any statement on the role of the two variables difficult and neither supports, nor contradicts the hypothesis formulated by Folker et al. (2021) with regards to attractiveness and positive orientation towards others. Even though the hypothesis concerning coping as a mechanism thereby had the most empirical support of the three within this review, these results are still not able to prove or disprove the hypothesis of a buffering effect of meaning in life against loneliness via the mechanism of higher coping abilities due to the cross-sectional nature of the

included analyses and the limited number of direct measures of coping. Overall, the lack of evidence is in accordance with the general observation of previous studies that the evidence concerning both the relationship between meaning in life and loneliness, as well as the underlying relationship between loneliness and mental health, is limited and needs further research (Folker et al., 2021; Macia et al., 2021; Quadt et al., 2020).

Limitations

The present review contains a number of limitations that should be taken into account. Firstly, the whole process of searching for literature as well as charting and analyzing the data was performed by a single researcher. Ideally this process should be divided within a team and reviewed by fellow researchers to reduce the risk of various biases and preventable human errors that can arise during all stages of the review process (Drucker et al., 2016).

Secondly, the search strategy might additionally have been limited by restricting it to a systematic database search exclusively instead of additionally including the snowball search method (Wohlin et al., 2022). While the systematic database search increases transparency and replicability, it is highly specific to the search terms used and becomes less exploratory. This way, it is possible that literature of relevant content was not obtained and reviewed if it did not show up in the specific database results based on the specific selected search terms.

Thirdly, the availability and scope of reviewed studies might have been limited by the selected inclusion and exclusion criteria and search terms in three different ways. Firstly, the search string used in the database search did not specifically include the key concepts of attractiveness, positive orientation towards others or coping as search terms. This choice was deliberately made by the researcher with the intent of avoiding a large number of unrelated studies that used those terms in unrelated contexts. Secondly, the decision to only include studies that conducted either a mediation or moderation analysis in addition to bivariate analyses could have overly narrowed the scope and reduced the degree to which the review was truly exploratory and open to different research designs. While this inclusion criterion was intended to increase the comparability of results by ensuring the inclusion of third variables, it is a possibility that thematically relevant literature was excluded. Thirdly, given the early stage of research in the specific field of this review, the additional inclusion of qualitative or mixed-methods research designs might have been beneficial and informative towards the aims of this study. However, as this limitation only became apparent in light of the limited amount of available quantitative evidence, it rather pertains the design of future reviews conducted in this field than a foreseeable limitation of the present review.

State of the art and implications for future research

As the available evidence regarding a bidirectional relationship between loneliness and meaning is still scarce yet promising, more research needs to be conducted that especially assesses the direction of meaning in life as a predictor of changes in loneliness. Concerning both directions of the relationship, the current state of evidence exclusively consists of cross-sectional studies. Therefore, future research should include longitudinal research designs to provide robust evidence on the causality of relationships that have previously been observed. While the findings of this review indicated that factors related to coping might play a role in the relationship between meaning in life and loneliness, there appears to be no existing research on the role of attractiveness and positive orientation towards others apart from hypotheses. Future research should be conducted to qualify the role of attractiveness and positive orientation towards others in the context of loneliness and perceived meaning. The measurement of attractiveness additionally requires more complex study designs with groupings such as rating and rated participants. Due to the cross-sectional nature of all included studies, the review of the evidence could neither falsify nor verify the hypothesis that meaning in life is a protective factor against loneliness. Longitudinal research should be conducted in the future to gain more insights into the causality of the relations.

Gaining a deeper understanding of the hypothesized causal mechanisms can have benefits beyond theoretical knowledge. Future research can inform practitioners on the potential efficacy of meaning-centered interventions and therapies for preventing and reducing loneliness. In the long run, meaning-centered treatments of loneliness should be assessed in clinical trials as it can represent an effective and cost-efficient method to both reduce the damage that loneliness inflicts on perceived meaning and thereby well-being as well as to prevent loneliness by strengthening meaning in life as a resource beneficial to adaptive coping. On the one hand, the moderating effects of coping-related variables found in this review indicate that meaning-centered interventions might be especially effective for target groups with a high degree of resilience or in combination with resilience-building interventions. Individuals with low levels of nostalgia, reflection, search for meaning or religiosity might especially benefit from meaning-centered interventions. On the other hand, the mediating effects found in this review can be interpreted to indicate that increasing meaning in life might partially be beneficial against loneliness by increasing dispositions related to adaptive coping such as (positive) religious coping, mindfulness and positive orientation. More research is needed to gain an understanding of the underlying working mechanisms and causalities involved in the beneficial effects of an enhanced sense of meaning in life.

In conclusion, while current research homogeneously showed that loneliness and meaning in life are negatively related to each other, there is a lack of evidence concerning the causalities and the underlying mechanisms involved in this relation. The present review found no evidence in support of a hypothesized relevance of attractiveness and positive regard towards others. The evidence appeared compatible with the hypothesized role of coping and related constructs despite a lack of direct measures of coping. Future research on the relation between meaning and loneliness should involve longitudinal designs and include direct measures of coping, attractiveness and positive regard towards others in order to attain robust evidence on the causality of the bivariate relations and the relevance of these three hypothesized mechanisms.

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