Title

Nonordinary Experiences, Well-being and Mental Health: A Systematic Review of the Evidence and Recommendations for Future Research

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Abstract

Throughout history, people have reported nonordinary experiences (NOEs) such as feelings of oneness with the universe and hearing voices. Although these experiences form the basis of several spiritual and religious traditions, experiencing NOEs may create stress and uncertainty among those who experience such events. To provide a more systematic overview of the research linking NOEs with mental health, we present a systematic review of studies focusing on NOEs, wellbeing and mental health indicators. In a search of ProQuest and PsycInfo, we identified 725 references, of which 157 reported empirical data and were included in our review. Overall, the studies reviewed suggest that the relationship between NOEs and mental health is complex, varying according to a series of psychological and social factors. In particular, they suggest that appraisal processes play a fundamental role in the mental health outcomes of these experiences. However, we also highlight important methodological challenges such as the conceptual overlap between NOEs and well-being or psychopathological constructs, the conflation between experiences and appraisal processes in the assessment procedure, and the need for clearer assessment of the duration, controllability, impact on daily functioning and general context of the experiences. We provide a qualitative summary of empirical evidence and main themes of research, and make recommendations for future investigation.

Keywords: anomalous experiences; mental health; wellbeing; systematic review; religion

Introduction

Throughout history, people have reported a variety of experiences that researchers consider nonordinary (NOEs), such as feelings of oneness with the universe, hearing voices, and premonitory dreams (Taves & Barlev, 2022).[1] These experiences vary widely and what distinguishes them is that they are presumably distinct from what people consider ordinary or everyday experiences. Such experiences are valued and cultivated by some spiritual and religious traditions and may be associated with spiritual growth and wellbeing. At the same time, phenomenologically similar experiences have been included in psychiatric manuals to denote pathological symptoms or signs under headings such as dissociation and hallucinations (Delmonte et al., 2015).

Indeed, such experiences have attracted much attention in the general public and specialist audiences alike for their possible insights or spiritual significance and even possible revelations about nonordinary powers or alternatively as indicators of mental disorders that provide insights into the functioning of the human mind. Across cultures, the prevalence of specific experiences that researchers consider nonordinary, such as premonitions and telepathic impressions, ranges from about 50% to 80% of respondents who state that they had experienced at least one such episode during their lifetime (Maraldi & Krippner, 2019). This tends to contradict their often-heard characterization as "bizarre" (French, 2001) or expectations that these experiences are rare or uncommon.

The relationship between these experiences and mental health is complex, in part because such experiences can be defined in multiple ways, depending on the research purpose and theoretical framework that researchers use to define them (to some lesser degree this is also relevant for mental health definitions). For example, some NOEs (such as near-death experiences or NDE's, which are reported by people close to death or under life-threatening situations) are reported to be associated with positive psychological change and increased spirituality (e.g.,

[1] Taves and Barlev distinguish between researcher-defined and subject-defined definitions of nonordinary experiences. Here we are using NOEs to refer to experiences that researchers consider nonordinary, which may or may not be seen as nonordinary by participants themselves.

Greyson, 2014; Khanna & Greyson, 2015) but they may also create significant stress and uncertainty (Lukoff, 1985). There is some discussion in the literature over whether some NOEs are more pathological than others, a debate that touches directly on the conceptual overlap between NOEs and psychopathology that we mentioned above, and which has attracted renewed attention in recent years (Flannelly, 2017; McCauley & Graham, 2020).

Some NOEs are defined in ways that are virtually indistinguishable from pathological phenomena (for example, intrusive anomalous self and identity experiences reported by patients diagnosed with dissociative identity disorder, Maraldi, 2017; Ross, 2011). Similarly, some NOEs may eventually contribute to the development of psychopathological symptoms, even if they are not inherently pathological. For example, NDEs may be followed by depressive symptoms and posttraumatic stress, especially in patients who have undergone a disturbing NDE or presented difficulty integrating an NDE into their lifestyle and belief systems (Greyson, 1997, 2001).

Here we use NOEs as a practical catchall term that encompasses studies of experiences that we can plausibly assume researchers view as nonordinary. In doing so, our aim is not to create another researcher-defined construct, but rather to cast a wider net in reviewing studies covering a range of experiences in relation to wellbeing and mental health. Thus, the available reviews to date tend to focus on specific terms such as “anomalous”, “exceptional” or “mystical” (e.g., Kerns et al., 2014; Roe, 2020; Simmonds-Moore, 2012; Wulff, 2014). To the best of our knowledge, no systematic review has focused on the relationship between the wide range of experiences that researchers consider nonordinary and wellbeing and mental health.

This is undoubtedly due, at least in part, to the fact that researchers interested in the study of NOEs typically work within the boundaries of their specific disciplines, despite the phenomenological similarities of experiences variously termed anomalous, religious, spiritual, mystical, psychic, and psychopathological (Lindeman & Svedholm, 2012; Taves & Barlev, 2022). Taves (2014) argues that such disciplinary barriers have precluded the development of a more comprehensive terminology. This is compounded when we consider that most of the questionnaires developed to assess nonordinary experiences use similar wording, even though the meaning of items differs (for example, an item that queries telepathic impressions may appear

both in a questionnaire assessing psychotic symptoms and a scale of paranormal experiences, bearing different conceptual and methodological implications in each case – see the section on differential diagnosis for examples). Within the methodological literature, these issues have recently attracted more attention (e.g., jingle-jangle fallacies, item redundancy, see (Cooper, 2019; Fischer & Alfons Karl, 2020; Marsh, 1994).

The overlap between NOEs and psychopathology (as suggested by terms such as psychotic and dissociative) renders the task of investigating the link with mental health particularly challenging, because it involves terminological, epistemological, and empirical difficulties. As a consequence, it is important to provide a more systematic review of the available studies to identify broad trends in the literature and possible shortcomings and avenues for future investigation. Our goals are therefore as follows:

A) To present a systematic review of empirical research that has examined nonordinary experiences and mental health or wellbeing;
B) Identify core instruments that have been used to measure nonordinary experiences and analyze how the construction of the measure may have influenced the association with wellbeing;
C) Identify key themes and concepts that need attention in future studies investigating nonordinary experiences and wellbeing.

Method

We searched PsycINFO and ProQuest databases in December 2021 using the following search strategy: Keywords: ("mental health" OR well-being OR wellbeing OR psychopathology OR psychotic OR dissociative OR depression) AND Keywords: (ritual* OR "altered states" OR "anomalous experience*" OR “exceptional experience*” OR "paranormal experience*" OR “non-ordinary” OR “nonordinary” OR “noetic” OR "religious experience*" OR "spiritual experience*" OR "unusual experience*" OR "mystical experience*"). We are aware that our search terms do not cover all possible definitions for NOEs, but they nevertheless afford a more comprehensive and inclusive overview and empirical estimate of the evidence of any relationships with mental health than previous reviews. The justification for choosing both PsycINFO and ProQuest was to

include relevant research published in psychology and human/social sciences journals. In the ProQuest search, we used the default search option “Anywhere except full text–NOFT”. In addition, we searched the reference lists of selected papers for further relevant publications.

Our inclusion criteria comprised original articles and dissertations/theses with either empirical or theoretical contributions regarding the relationship between NOEs and mental health/wellbeing/psychopathology. No constraint of date or language was adopted. Book reviews, conference abstracts, studies reporting the same data, opinion articles and comments elaborating on ideas expressed by authors in empirical or theoretical primary publications were excluded from further analysis and discussion. We also excluded publications focusing on findings of religiosity/spirituality and mental health that do not specifically address the topic of NOEs.

We acknowledge that this distinction might be contentious because some religiosity or spirituality surveys do include questions about NOEs, and measures that are often considered instruments for measuring NOEs may include questions on nonordinary beliefs. The reason for exclusion in our review was that these instruments typically do not allow us to examine the specific aspect of nonordinary *experiences* independently of other belief or practice components associated with religion or spirituality. In the current review, we tried to use an inclusive perspective that captures NOEs broadly. In the discussion, we outline some shortcomings of this approach, which is common in the wider literature we examine, without focusing on the specific types of experiences given the state of the literature. As we will show, the current literature tends to conceptualize NOEs as an overarching category with either positive or pathological valence (e.g., psychotic, religious, spiritual). However, our main argument, as emphasized throughout the paper, is that a more insightful approach can be achieved by adopting a feature-based perspective on NOEs (Taves and Barlev, 2022). This perspective suggests that "types" need to be distinguished based on their phenomenology rather than the claims made about them, that is, that they are religious, anomalous, or psychotic.

Results and Discussion

Our search yielded 709 articles. The PRISMA flowchart (Figure 1) outlines the steps in review process and the articles excluded at each step. A total of 157 references were deemed relevant to our review.

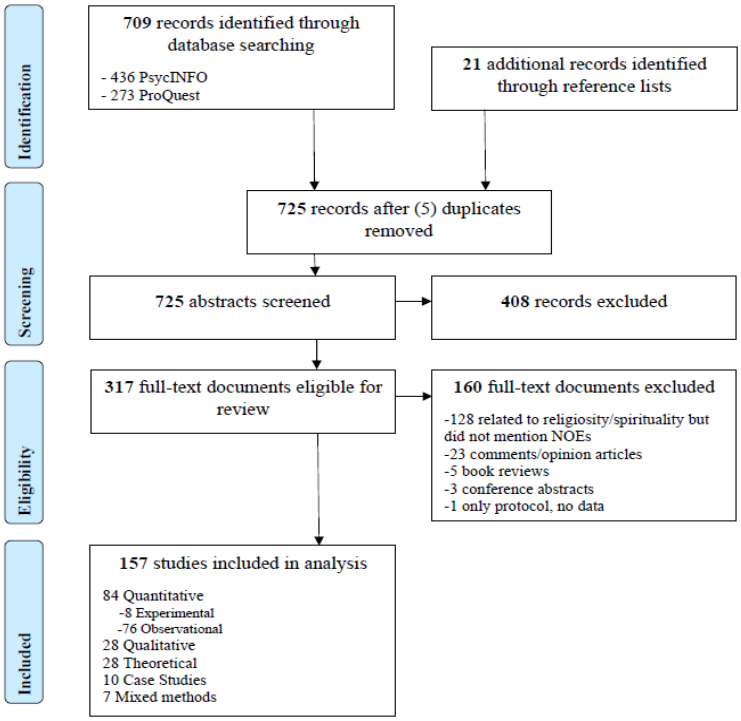

Figure 1. PRISMA diagram for selection of studies

Descriptive information on the included studies

The empirical studies investigating the relationship between NOEs and mental health identified in our search were usually based on quantitative or mixed methods research designs. Participants were typically members of the general population (48 manuscripts), but some studies (k = 8) also compared members of clinical and non-clinical populations in terms of frequency, correlates, predictors, and mediators/moderators of NOEs. A subset of studies (k =14) explicitly compared religious/spiritual versus non-religious/spiritual participants or practitioners with different levels of involvement or practice.

In order to explore how the quantitative studies assessed nonordinary experiences and their respective dimensions in greater depth, we listed each measure used and their main characteristics

(see Table 1 for the list of measures and Figure 2 for the frequency of publications by year). We identified 28 standard measures used in 71 empirical studies. Studies using ad-hoc questionnaires developed for the purpose of a specific study (k=14) were not included in the table. The single most commonly mentioned scale was the Daily Spiritual Experience Scale (Underwood, 2011), used in 16 empirical articles. Of the 28 measures identified in our search, 11 measures provide a total score only, 9 provide total and subscale scores, and 8 provide separate scores for separate factors. This observation is noteworthy because it implies that the majority of scales (k = 19) presume that nonordinary experiences are either interchangeable or that some emergent property allows researchers to sum up the individual observations and represent a person's experiences in a single score. Four measures (AANEX, OAV, PAGE-R and Unusual Experiences Questionnaire) include specific questions about, for example, the frequency, intensity, duration, and control of NOEs. Two measures (AANEX and SAE) ask about appraisals of the experiences. The Anomalous Experiences Inventory (AEI) differentiates between experiences and beliefs and examines such aspects as fear of the paranormal and "use of drugs and alcohol" (Gallagher et al., 1994, p. 422). Overall, these measures thus vary widely in terms of whether they consider NOEs as unitary or multifaceted, as well as whether they ask follow up questions about these experiences, which may become relevant when considering the relationship with mental health or wellbeing.

We also examined whether existing measures differentiate between positive and negative NOEs and whether health-related factors such as prosocial attitudes, positive emotions (e.g., joy, happiness), and well-being feature in the total score. We found that 12 measures assess health-related factors as part of nonordinary experiences. Of these, 11 include wellbeing related items in the total score (even when subscale scores are used). Five measures (EEQ, OAV, SenPQ, EDI, NETI) differentiate between positive (e.g., divine light) and negative (e.g., ego inflation) experiences. On the other hand, we also identified seven measures (DDIS, DES, CAPS, MMSI-2-R, O-LIFE, AANEX, Unusual Experiences Questionnaire) that clearly include items that conceptually overlap with psychopathological constructs such as dissociation, schizotypy, and psychotic symptoms. We discuss the methodological and theoretical implications of these

psychometric characteristics below in the section on methodological shortcomings and in the general discussion.

Table 1. Principal measures used, types of experiences assessed and scoring procedures

Measure	#studies (%)	Types of experience	Score
Dissociative Disorders Interview Schedule (DDIS) (Ross et al., 1989)	5 (7.04)	Dissociative, possession, and paranormal experiences, as well as a series of psychopathological indicators (psychotic, depressive and somatic symptoms, borderline personality, trauma, imaginary companions). Most items measure more negative experiences	Separate scores for each section (15 in total). No total score for the entire interview
Dissociative Experiences Scale (DES) (Bernstein & Putnam, 1986)	6 (8.45)	Cognitive dissociation (alterations in the sense of self, memory, and perception of the environment)	Total and subscale scores (depersonalization, amnesia, absorption)
Spiritual Orientation Inventory (SOI) (Elkins et al., 1988)	2 (2.82)	Transcendental experiences, meaning and purpose in life, values, prosocial attitudes (altruism), well-being ("fruits of spirituality")	Total and subscale scores: (1) Transcendent dimension, (2) Meaning and purpose in life, (3) Mission in life, (4) Sacredness of life, (5) Material value, (6) Altruism, (7) Idealism, (8) Awareness of the tragic, and (9) Fruits of spirituality.
Altered States of Consciousness Rating Scale (OAV) (Studerus et al., 2010)	2 (2.82)	Both positive and negative ASCs. Also, some characteristics of such experiences (e.g., impaired control, anxiety)	Total and subscale scores (Blissful, Spiritual experience, Unity, Insightfulness, Change meaning, Disembodiment, Complex imagery, Elementary imagery, Audiovisual, Impaired control, Anxiety)
Cardiff Anomalous Perceptions Scale (CAPS) (Bell et al., 2006)	2 (2.82)	Items use neutral wording. Overall, however, the scale tends to cover more pathological experiences ("disturbances of perception")	Total and subscale scores (clinical psychosis, temporal lobe disturbances, and chemosensation)

PAGE-R (Fach et al., 2013)	3 (4.23)	Exceptional experiences (Ees): external (e.g. thermal, kinetic, and olfactory phenomena), internal (e.g., somatic sensations, thought insertion, hearing voices), coincidence (e.g., telepathy, precognition), dissociation (e.g., bodily paralysis, mediumship, OBE)	Total (average) and subscale (sum) scores (external, internal, coincidence, dissociation). Frequency and intensity of experiences are also independently assessed.
Hood's Mysticism Scale (Hood, 1975)	6 (8.45)	Experiences of mystical union and oneness with all things, loss of sense of self, transcendence of time and space, and insightful knowledge. Also, some characteristics of the experiences such as ineffability, positive affect, and religious interpretation	Different factorial structures over time. The most widely used is a three-factor solution based on Walter Stace's philosophy of mysticism: introvertive mysticism, extravertive mysticism, and religious interpretation
Francis' measure of mystical experience (Francis & Robbins, 2014)	2 (2.82)	Oneness with myself and all things, everything in the world is part of the same whole, self-merging into something greater	Total score (three-item measure)
Daily Spiritual Experiences Scale (DSES) (Underwood & Teresi, 2002)	16 (22.54)	Experiences such as feeling the presence of God, feeling a connection to all life, intense joy during religious worship, being spiritually touched by the beauty of creation, feeling close to God or the divine. The scale also measures non-experiential variables such as spiritual well-being ("finding strength and comfort in my religion or spirituality"), asking for God's love and guidance, feeling grateful and selfless about others (prosocial attitudes)	Total and subscale scores (different factorial structures depending on study and group membership)
Revised Mystical Experiences Questionnaire (MEQ30) (Barrett et al., 2015)	4 (5.63)	Experiences of pure being or awareness, oneness and fusion into a larger whole, ultimate reality, insightful knowledge, amazement and awe, loss of sense of time	Total and subscale scores (different factorial structures depending on the study)

		and self. It also includes some items on ineffability and feelings of peace, tranquility, joy, tenderness and gentleness	
Altered State of Consciousness Scale (APZ) – Oceanic Boundlessness subscale (Dittrich, 1998)	1 (1.41)	Feeling that everything around you is unreal (derealization), floating experience, boundlessness between the self and the environment, indifference toward everything, oneness with the environment, blurring between dreaming and waking state, bodiless state, absorption. It also includes items on intense happiness and an experience of freedom from all responsibilities and conflicts	Total score
Anomalous Experiences Inventory (AEI) (Gallagher et al., 1994)	5 (7.04)	Unusual experiences including interactions with aliens or the dead, out-of-body and mystical experiences, and putative psychic experiences. It also includes three subscales assessing paranormal abilities, fear of the paranormal, and use of drugs and alcohol	Sum of all "Yes" responses to experience items
Multivariable Multiaxial Suggestibility Inventory-2 Reduced (MMSI-2-R) (Escolà-Gascón & Gallifa, 2020)	1 (1.41)	Hallucinatory experiences	Six factors or scales: visual and Auditory Perception (Pva); Cenesthetic Perception (Pc); Olfactory Perception (Po); Touch Perception(Pt); Taste Perception (Pg); and Paranoid Experience (Et)
Synesthesia Experience Questionnaire (SEQ) (Simmonds-Moore et al., 2019)	1 (1.41)	Different types of synesthesia involving different combinations of sensory modalities	Total score (sum of all items)
Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE) (Mason et al., 2005)	6 (8.45)	Different psychotic-like symptoms and characteristics from hallucinations to disorganized thought and social deficits	Subscale scores (unusual experiences, introvertive anhedonia, cognitive disorganization, impulsive nonconformity)

Spiritual Emergency Scale (SES) (Goretzki et al., 2013)	1 (1.41)	Interconnectedness/Spiritual Opening, Experience of Another Time/Place/World, Experience of Spiritual Entities/Energies, and Loss of Identity/Reality and ASCs.	Different factorial structures depending on study. The scale covers a series of anomalous experiences including Interconnectedness/Spiritual Opening, Experience of Another Time/Place/World (e.g., past life), Experience of Spiritual Entities/Energies, and Loss of Identity/Reality and ASCs.
Survey of Anomalous Experiences (SAE) (Irwin et al., 2013)	1 (1.41)	20 items addressing anomalous or uncanny experiences, including apparent telepathy, clairvoyance, precognition, psychokinesis, apparitions, psychic healing, out-of-body experiences, near-death experiences, reincarnation and astrological predictions. The scale differentiates between anomalous experiences and attributions	The SAE yields two scores for each participant. First, an index of proneness to anomalous experiences (PAE) is computed as the percentage of "yes" responses (i.e. Option 1 or 2 in any item) made over the 20 items; thus, this score could range from 0% to 100%. Second, each participant's proneness to attribute anomalous experiences to paranormal phenomena is defined as the percentage of "yes" (Option 1 or 2) responses that were "yes, paranormal" (Option 1) responses.
Exceptional Experiences Questionnaire (EEQ) (Kohls & Walach, 2006)	3 (4.23)	1. Positive spiritual experiences (e.g., divine light), 2. Ego loss and deconstruction, 3. Psychopathological or delusionary experiences, 4. Visionary dream experiences	Subscale scores (four factors)
Mystical Experience Scale (MES) (Lange & Thalbourne, 2007)	1 (1.41)	Mystical experiences such as union with God or humanity, intense happiness, intense love, ecstasy, special wisdom, experiences beyond space and time, and many others.	Total score (sum of all items, true/false responses)
Tellegen Absorption Scale (TAS) (Tellegen & Atkinson, 1974)	2 (2.82)	Absorption or imaginative involvement experiences (e.g., tendency to become immersed in nature and art; daydream; mystical experience)	Total score (sum of all items, true/false responses)

Appraisals of Anomalous Experiences Interview (AANEX) (Brett et al., 2014)	5 (7.04)	AANEX-Inventory consists of 17 items covering five factors: 'meaning–reference' (e.g. ideas of reference); 'paranormal–hallucinatory' (e.g. visual or somatic hallucinations); 'cognitive–attention' (e.g. thought block); 'dissociative–perceptual' (e.g. depersonalization); and 'first-rank symptoms' (e.g. hearing voices)	Factor scores are obtained by summing individual item scores (state factors). Additional items examine context at onset, appraisals, social support, control, and cognitive-behavioral response
Unusual Experiences Questionnaire (Laurens et al., 2012)	3 (4.23)	Nine items covering experiences such as visual and auditory hallucinations, paranoid ideation, special powers, special messages, feelings of being controlled by an external force, unusual body perceptions, and "mind reading" experiences (reading other people's thoughts or having one's thoughts read by others). The scale was developed to assess psychotic-like symptoms among children	Items are rated for Conviction or endorsement, Distress, Impact, and Frequency over the past two weeks. Item scores range from 0–11 and can be summed across the scale to generate an overall UED severity score ranging from 0–99.
Sensed Presence Questionnaire (SenPQ) (Barnby & Bell, 2017)	1 (1.41)	Sixteen items covering different types of sensed presence experience. A principal components analysis suggested two factors, malign (sinister or threatening) and benign (protective and comforting) presence.	Total and subscale scores
Ego-dissolution Inventory (EDI) (Nour et al., 2016)	1 (1.41)	Feelings of increased union with one's surroundings (dissolved ego-boundaries). Elevated self-assuredness and confidence ("ego-inflation")	Different scores for ego-dissolution and ego-inflation factors
Experienced Deviation from Normal State (EDN) (Kjellgren, 2003)	1 (1.41)	It is not clear what types of experiences this scale measures. Apparently, alterations in the perception of the environment, time perception, ego dissolution, and others.	Total score

Near-Death Experience Scale (NDE) (Greyson, 1983)	3 (4.23)	The scale includes questions about cognitive processes (e.g. “Did time seem to speed up or slow down?”), affective processes (e.g., “Did you have a feeling of peace or pleasantness?”), purportedly paranormal processes (e.g., “Did you feel separated from your physical body?”), and experienced transcendence (e.g., “Did you seem to enter some other, unearthly world?’).	Total score
Non-dual embodiment thematic inventory (NETI) (Butlein, 2005)	1 (1.41)	Experiences of oneness, a sense of no separation between self and the whole existence, experiences of intense love, gratitude, curiosity, intense freedom and well-being (various items are not distinguishable from well-being/mental health). Four items assess negative experiences such as fear, anxiety, and negative self-image	Total score. The four negative items are reverse scored.
Kundalini Awakening Scale (KAS) (Sanches & Daniels, 2008)	1 (1.41)	Experiences of alterations in consciousness, mystical experiences, and unusual somatic and psychological symptoms (e.g., changes in body temperature, visual hallucinations)	Total and subscale scores. Five subscales: changes (15 items); involuntary positionings (3 items); physical symptoms (20 items); negative experiences (12 items); and positive experiences (9 items)

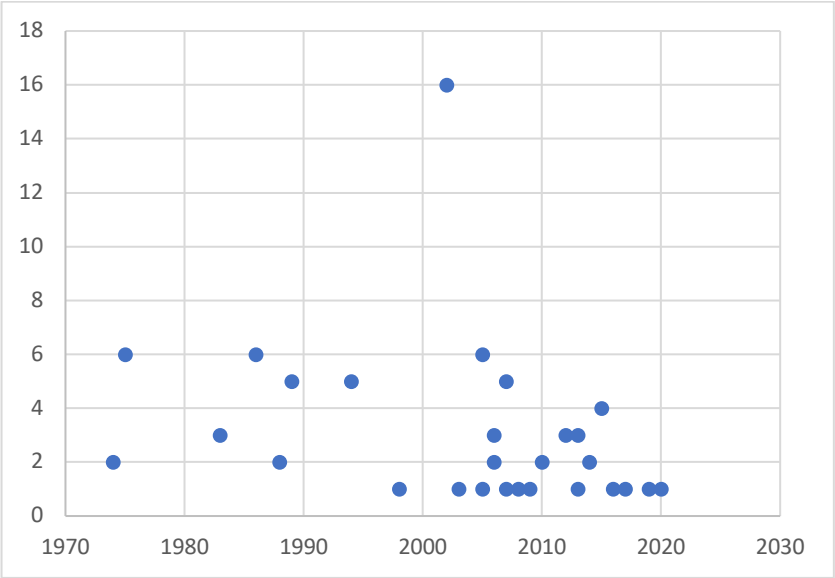

Figure 2. Frequency of publications of principal measures by year

To provide some structure to the next section of our review: first, we present a brief review of the main findings of these studies, focusing specifically on correlational and experimental investigations that have examined the links between NOEs and mental health. We then discuss individual difference variables and contextual moderators of the possible linkages. Then, we discuss research on appraisals and their mental health implications. The fourth section is devoted to a survey of the methodological shortcomings of empirical studies. We then review existing guidelines for differentiating pathological from healthy NOEs and discuss their contributions and limitations based on both empirical and theoretical studies. In the final section, we consider the possibility of a differential diagnosis of NOEs in relation to mental health and research considering trajectories of NOEs that may either lead to growth or to impairment. In our concluding remarks, we provide a brief summary of the main findings, present limitations of our review strategy and outline directions for future research.

In what follows, we discuss our findings under five headings: relationships between NOEs and mental health, individual differences and context moderators, appraisal processes and the mental health implications of NOEs, methodological shortcomings of available studies, and attempts at differential diagnosis.

Relationships between NOEs and mental health

A number of researchers have identified positive correlations of different NOEs with mental well-being or positive psychological states such as joy, enhanced sense of meaning or life purpose, and enhanced coping capacity in the face of suffering and bereavement (Benning et al., 2021; Bovero et al., 2019; Elsaesser et al., 2021; Jahn & Spencer-Thomas, 2018; Kalkstein & Tower, 2009; Kennedy et al., 1994; Kennedy & Kanthamani, 1995; Kent et al., 2020; Krause & Bastida, 2009; Lee, 2011; Rabeyron et al., 2018; Rudaz et al., 2019; Saiz et al., 2021; Wilde et al., 2019). In contrast, some investigations have found either inverse (Ballew et al., 2012; Ho et al., 2016; Koenig et al., 2016; Lee, 2011; Park & Roh, 2013; Simmonds-Moore et al., 2019; Whitaker et al., 2021) or no significant association between NOEs and psychopathological variables (Barnby & Bell, 2017; Caird, 1987; Cooper et al., 2015; Francis et al., 2015; Francis & Robbins, 2014; Kroll et al., 1996; Simmonds-Moore et al., 2019; Thalbourne, 2007).

This list of studies makes it clear that the empirical evidence of the relationship between NOEs and mental health is complex. For example, it was found that a history of trauma and psychopathological symptoms is sometimes associated with NOEs such as dissociative and extra-sensory perception experiences (Hecker et al., 2015; Rabeyron & Watt, 2010; Ross & Joshi, 1992; Scimeca et al., 2015 - but see Kroll et al., 1996). Other studies have found that NOEs such as NDEs and certain mystical experiences may trigger a transformational process that leads to post-traumatic growth and greater psychological integration (Benning et al., 2021; Khanna & Greyson, 2015; Royse & Badger, 2017).

In fact, a closer examination of the evidence suggests that the link between NOEs and psychopathology/mental health varies according to a series of psychological and social factors and that the associations do not follow a unidirectional pathway (Dein, 2012; Kent et al., 2020; McClenon, 2012; Ouwehand et al., 2018; Thalbourne & Delin, 1994). Overall, the evidence indicates that how individuals make sense of these experiences is of importance when considering mental health linkages – see the section on appraisals for a more detailed discussion of this point.

Some investigators also identified differences between subgroups of religious/spiritual believers. Negro et al. (2002) and Cardeña et al. (2015) found that spiritual practitioners such as trance mediums typically do not evidence higher psychological distress regarding NOEs. They did, however, identify subsets of individuals who may report difficulties in handling and controlling their experiences (for example, in terms of frequency and intensity). Why these individuals experienced a negative rather than a positive psychological trajectory is an important topic for further research (see below the section on differential diagnosis). Similarly, Kohls and Walach (2006) verified that individuals practicing meditation or other spiritual techniques on a regular basis scored higher on both ego loss/deconstruction and positive spiritual experiences (e.g., spiritual powers inspire me at work) than non-practitioners and a clinical sample. This once again suggests that NOEs may involve both positive/adaptive and non-adaptive/negative presentations.

Kohls and Walach (2007) reported that NOEs (such as being illuminated by divine light, hearing voices, ego loss, and premonitory dreams) were significantly associated with symptoms of mental distress but the strength of association was lower for spiritual practitioners compared to non-practitioners. Spiritual practitioners also scored significantly higher on positive spiritual experiences when compared to non-practitioners. The authors thus concluded that "instead of interpreting spiritual practice as a direct and causal resilience factor against negative spiritual experiences, our data rather suggest that lack of spiritual practice could potentially be an important risk factor for suffering distress from experiences of ego loss" (p. 1311-1312).

There is also the distinct possibility that religious/spiritual appraisals function as barriers to adequate medical treatment. For instance, Lauerma and Tuliharju (1998) noted that in the two cases discussed in their paper, the patients misinterpreted their neurological motor disorder symptoms as religious experiences which meant that they did not seek out appropriate treatment. This finding potentially points to a different perspective on the often-mentioned religion-mental health continuum.

Appraisal processes may not only influence or shape positive/negative presentations of NOEs but may also limit people's understanding of the nature of certain psychopathological or

mental health processes and influence their health strategies. Given the preliminary status of our theoretical comprehension of the link between NOEs and mental health, all empirical possibilities should be considered and further investigated. Although it is important to highlight that appraisals may impede help seeking, this possibility has not received much attention as indicated by the lack of studies that emerged in our review.

Individual differences and context moderators

Moving to individual differences, the research suggests that certain groups of individuals are more predisposed to report these experiences, in particular individuals with high scores on dissociation or suggestibility (Acunzo et al., 2020; Pekala et al., 1995). Research on broader personality traits also points towards certain personality dimensions that may predispose individuals to experience NOEs more frequently or to appraise them differently (e.g., Alminhana et al., 2017a, 2017b). Exploring these linkages, some researchers have suggested that personality characteristics could partially account for differences between pathological and non-pathological NOEs.

Based on Cloninger's psychobiological model of temperament and character (Cloninger et al., 1993), Alminhana et al. (2017a, 2017b) found that NOEs such as mediumistic experiences (e.g., communication with the dead and/or other spiritual entities) were best predicted by self-transcendence – which includes elements of spiritual contemplation and well-being – and that self-directedness predicted psychological quality of life and an overall decrease in symptoms of cognitive disorganization and impulsive nonconformity among attendants of spiritist centers in Brazil. This study suggests that individuals reporting higher levels of self-transcendence and self-directedness might be more protected against negative mental health outcomes when experiencing NOEs than those reporting lower levels. On the other hand, in a study by Francis et al. (2015), the authors were unable to identify any evidence of association between NOEs such as experiences of "oneness with all things" and clinically relevant personality dimensions such as neuroticism and psychoticism.

Focusing on context effects, the location where NOEs are experienced may have important implications for mental health. A number of studies have investigated whether experiences in natural vs urban human-built environments or specific locations (e.g., hospital, religious ritual) have an influence (Havik et al., 2015; Snell & Simmonds, 2012, 2015; Uthaug et al., 2019). The evidence available so far suggests that the context has implications for how NOEs are both triggered and appraised, thereby influencing their positive (or negative) outcomes for wellbeing (e.g., the role of natural environments in eliciting experiences of intense absorption in nature).

Beyond the physical environment, there is increasing ethnographic and qualitative evidence suggesting that individuals experiencing disturbing or unwanted NOEs tend to benefit from coping strategies developed in the context of rituals and other spiritual practices embedded in social communities (Cardeña & Schaffler, 2018; Delmonte et al., 2015; Maraldi, 2014; Roxburgh & Roe, 2014; Seligman, 2005; Somer & Saadon, 2000). These studies usually emphasize the role of social learning during rituals or religious gatherings as a means of obtaining control over the experiences and reducing negative outcomes such as fear, uncontrollability, and distress.

These observations align with those by Luhrmann (2004) and Dobson (2021), who have emphasized the role of social learning in the development and modulation of NOEs. Religious rituals are known to facilitate stress management and pain regulation, and tend to promote physical, mental, and social well-being among practitioners (Hobson et al., 2018; Sohi et al., 2018; Xygalatas et al., 2019). Additionally, Jegindø et al. (2013) found that NOEs, such as depersonalization, were associated with low levels of pain. This finding suggests a mediating effect of NOEs on the salutary effects of rituals. A series of authors have also argued that religious communities provide norms and ritualistic practices that act as buffers against potential pathological presentations of personality and religious experience (Hanel et al., 2019; Kent et al., 2020; Kohls & Walach, 2007).

One good example of the importance of religious frameworks for moderating the NOE-wellbeing link can be found in this study of patients suffering from negative spirit possession in Uganda: van Duijl et al. (2014) reported that two-thirds of the respondents were unsuccessful in obtaining relief for their disturbing experiences when first seeking medical healthcare, while 99%

reported improvements after attending local healing sites. The authors emphasized the importance of considering religious/spiritual explanatory models and practices in the development of effective mental health services, especially in low-and middle-income countries.

Similar findings concerning the efficacy of spiritual practices over Western medical and psychological interventions in coping with negative NOEs such as spirit possession were also reported by Schultz and Weisæth (2015), Brook (2017), Martinotti et al. (2018), Jimenez Fernandez et al. (2018), and Lindsay et al. (2020). Somewhat at variance with these overall positive effects, Snodgrass et al. (2017) found that rituals may be effective but primarily for wealthier and healthier participants. Similarly, Xygalatas et al. (2019) reported no changes in physiological markers, but identified increased psychological wellbeing among participants after the rituals, which included bodily piercings etcetera (note: the study was not specifically focused on NOEs, but participants in this context often experience NOEs such as trance as part of the rituals; see also Jegindø et al., 2013). It is thus of fundamental importance that future studies employ longitudinal and well-controlled research designs in order to reliably assess the presumed positive impact of spiritual practices on NOEs.

Appraisal processes and the mental health implications of NOEs

In this section, we expand on findings and conceptual issues related to appraisal processes in our body of studies. Focusing first on definitional issues, we note that the terms “belief” and “appraisal” are often used interchangeably in the literature. Woods and Wilkinson 2017) discuss whether appraisals should be viewed as “in-the-moment” assessments or as belief systems that “can develop over time through socially meaningful practices of cultivation, which in turn might shape phenomenology” (p. 892). The authors end up concluding that the answer to this question cannot be reached by psychiatry alone but will require further understanding “of the relevance of spiritual context” and “modes of inquiry indigenous” to religious or spiritual groups.

Indeed, it is known that those who believe in nonordinary phenomena report NOEs more often (Escolà-Gascón & Gallifa, 2020). Thalbourne (2007) reported that religious beliefs were predicted by experiences that the author defined [but not the subject?] as mystical (e.g.,

transcendence of time and space) but not by those [Thalbourne or subjects?] considered psychopathological. This ambiguity or conceptual overlap [between what and what] immediately highlights an important avenue for future theoretical and methodological development. The importance of further research on this distinction [between what and what] parallels the problems with the confounding in the measurement of NOE and mental health or wellbeing.

Focusing on empirical research, the aforementioned findings by van Duijl and collaborators (2014) as well as ideas by Scrutton (2016) suggest that the way an individual or group appraises (i.e., interprets or attributes meaning to) non-ordinary experiences may influence their positive or negative life consequences. Indeed, currently available research on NOEs points towards the fundamental role of cultural expectations and cognitive models for understanding the mental health outcomes of these experiences, even though little is known about the precise mechanisms by which appraisals initiate, modulate, and are impacted or shaped by such nonordinary accounts (Maraldi & Krippner, 2019; Taves & Barlev, 2022).

As we discussed above, the extent to which NOEs accompany religious, spiritual or paranormal beliefs varies according to the cultural context and measurement procedures (Maraldi & Krippner, 2019). An important challenge is the differentiation between experience and belief in questionnaires measuring these constructs. Taves (2020) recommended separating generic experiences from appraisals of valence, significance, cause, and long-term effects. We could imagine that other appraisals may be important to add to this list when thinking about wellbeing, including controllability, temporal impact and frequency. Currently, many studies tend to merge experiences and appraisals. In the following, we focus on some studies that allow some separation between them.

Demonstrating the importance of appraisals in general, de Boer (2020) found that individuals who failed to make sense of their out-of-body experiences (OBEs) reported higher anxiety, ego loss/deconstruction and self-unclarity, as well as lower mindfulness. Their perceived anxiety and self-unclarity were directly related to how scared and confused they were about the experience. On the other hand, those who relied on spiritual explanations were able to make sense of the OBE. Similarly, Nour et al. (2016) observed that experiences of ego dissolution (such as

feeling one with the universe, feeling a sense of union with others or loss of sense of self) may be seen either as destructive or life-enhancing, depending on how these experiences were appraised and valued.

Van der Tempel and Moodley (2020) investigated spontaneous nonordinary experiences (such as a felt sense of unity and boundlessness and absorption in nature) among atheists and found that their accounts paralleled those of religious believers in terms of phenomenological characteristics. However, atheists had difficulty reconciling their experiences with secular worldviews and values. Individuals with religious upbringings eventually resorted to spiritual/religious interpretations when naturalistic appraisals were perceived as inadequate or reductionist. Secular (scientific, medical, or psychological) interpretations were often described as incompatible with the strong emotional component of NOEs, especially the sense of specialness or sacredness promoted by the experiences. Participants who reported doubt and preoccupation about their NOEs evidenced more psychological distress and appraising the experiences as pathological was associated with feelings of fear and shock. Nonetheless, the experiences overall showed some beneficial effects for individuals, sometimes accompanying enhanced subjective wellbeing, and improved emotional and interpersonal functioning.

Focusing on possible moderators, Schofield and Claridge (2007) hypothesized that having a stable belief framework may function as a protective mechanism against the pathological consequences of NOEs such as seeing ghosts or lights, clairvoyance, and telepathy, a mechanism that is especially available for individuals with greater cognitive organization. They found that cognitive disorganisation moderated the association between schizotypy and NOEs, with highly cognitively disorganised respondents showing greater linkages between schizotypy and distressing NOEs, while cognitively organized participants reported a positive relationship between schizotypy and pleasant NOEs. It is at present unclear whether cognitively organized individuals tend to endorse or develop a belief framework to help them cope with NOEs or whether holding a stable belief framework leads to more positive health outcomes including higher cognitive organization and positive/adaptive experiences.

Methodological shortcomings of available studies

As we mentioned in several places already, one major problem in this research area is the use of measures that do not clearly distinguish between NOEs and either healthy or unhealthy psychological states. This is also a well-known problem in the broader field of religion/spirituality and health (Koenig, 2011; Maraldi, 2020) and within psychology more generally (see for example, Cooper, 2019; Marsh, 1994). In the area of NOEs specifically, Hammer and Cragun (2019) criticized the widely used Daily Spiritual Experiences Scale or DSE (Underwood & Teresi, 2002) for mixing items measuring spiritual experiences with items drawn from constructs such as well-being and prosociality. For instance, the DSE includes items such as "I find strength in my religion or spirituality"*, "I find comfort in my religion or spirituality"*, “I feel deep inner peace or harmony”* and "I feel thankful for my blessings", which are closely related to concepts of positive mental health and well-being. Additionally, the item "I feel God's love for me through others"* captures gratitude and item "I feel a selfless caring for others" measures prosocial tendencies (Items with * indicate reverse coded items). Hammer and Cragun (2019) also identified different factorial structures for religious, spiritual, and neither religious nor spiritual participants, suggesting that participants are interpreting the DSE items differently according to group membership. Similar problems have been reported by Schuurmans-Stekhoven (2013).

Illustrative of the challenges involving measurement bias is the study by Ross and Browning (2018). The authors employed different measures of altered states of consciousness (some of which assess adaptive states such as the Spiritual Orientation Inventory or SOI, Elkins et al., 1988, and some of which are considered non-adaptive such as the Dissociative Experiences Scale Taxon, or DES-T, which is hypothesized to be more sensitive to pathological dissociation, Waller et al., 1996) and investigated their association with dissociative symptoms in a group of inpatients in a trauma program. They found that the more adaptive states did not correlate significantly with childhood trauma and pathological perceptual experiences. However, extra-sensory perception/paranormal experiences (broadly defined) showed weak to moderate correlations with both pathological and non-pathological dissociative states, as well as with somatic, psychotic, and borderline personality disorder symptoms.

Based on the findings for the Spiritual Orientation Inventory, the authors concluded that adaptive states might be “spiritual in nature” (though they did not explain what they meant by spiritual). However, the phenomenological experiences captured by the items within the instruments were similar, suggesting that the phrasing may have cued responses, which then resulted in these diverging correlations. Reflecting the larger problems concerning measurement, some items of the SOI overlap with well-being, which may bias the results and therefore challenge straightforward interpretations of the findings. Examples of SOI items overlapping with well-being and prosociality include “Generally, I value love and cooperation more than competitiveness," "Contact with the transcendent, spiritual dimension has helped reduce my personal stress level," "I believe that alcoholics, drug addicts, and others whose lives are out of control can be helped through contact with the transcendent, spiritual dimension," "Contact with the transcendent, spiritual dimension has enhanced my emotional health," and "I am personally devoted to what I consider to be a meaningful cause". Actually, the SOI was conceptualized as a measure of “humanistic-phenomenological spirituality” (Elkins et al., 1988), which suggests an emphasis on more positive experiences.

In the case of aggregate measures (where items are summed or averaged to arrive at a total score), it is not clear how exactly one should interpret a total score of NOEs. Are there significant psychological differences between those who endorse many items and those who endorse only one or a few items? With respect to mental health and well-being, does it matter which NOEs are endorsed? These are questions that remain to be more fully investigated.

Another problem with the use of aggregate measures is the interpretation of NOEs exclusively as aspects of religiosity or as pathological states based on researcher-defined constructs such as, for example, “dissociation” or “mysticism”. When working with non-affiliated individuals or those who are neither religious nor spiritual, participants may feel that these options do not adequately represent their own experiences (Dein, 2016). Moreover, when items appear in the context of a researcher-defined construct, this can affect their interpretation. Thus, for example, in the O-LIFE (Oxford–Liverpool Inventory of Feelings and Experiences, Mason, Linney, & Claridge (2005), a measure of schizotypal/psychotic symptoms, some items reflect

telepathic experiences ("Do you think that you could learn to read other's minds if you wanted to?") and visual hallucinations ("When in the dark do you often see shapes and forms even though there is nothing there?"). The labeling of these experiences as psychotic in the context of the measurement instrument tends to favor a more pathological interpretation, thereby influencing the way they are categorized, studied, and dealt with (we will return to this issue in the next section).

In addition to the conceptual overlap, it is possible that items presented first prime the interpretation of subsequent items. For example, when items assessing religiosity are presented first, items on NOEs may be interpreted differently (Maraldi, 2020). Measurement issues clearly demand greater elaboration and differentiation in future research.

Differential diagnosis of NOEs

Focusing on empirical results, the evidence indicates, first of all, that NOEs tend to correlate especially with positive schizotypy symptoms (such as visual or auditory hallucinations) and less frequently with negative ones such as social detachment and self-harm (Bitēna & Mārtinsone, 2021). Once again, it might be difficult to rule out the possibility of overlap between item content, given that certain positive symptoms of psychosis are virtually indistinguishable from non-pathological or religious or spiritual NOEs such as seeing visions, hearing the voice of God, or claiming one has a spiritual mission or purpose (Luhrmann, 2004, 2005).

There is indeed evidence indicating that some NOEs and some psychotic symptoms are correlated with the same variables, such as aberrant salience – the tendency to attribute significance or importance to stimuli that would normally be considered irrelevant – and heightened sensory sensitivity (Irwin et al., 2014). Aberrant salience might actually be defined as a tendency to endorse or develop pathological appraisals, perhaps resulting from dysregulated dopamine function and disrupted salience processing by the salience network in the brain (Rössler et al., 2020).

It is important to consider, however, that certain contexts or practices such as religious groups and contemplative traditions might encourage individuals to attribute significance or

importance to stimuli that may be deemed irrelevant or aberrant by other groups, cultures, traditions, and Western psychiatrists or psychologists (as well as psychiatric or psychological measures). Consequently, researchers should consider the possibility that constructs such as "aberrant salience" and "patternicity" (Shermer, 2002) rely on a conception of normal cognitive functioning that is not necessarily generalizable to all individuals and cultures. Such discussion has potential implications for future research on the role of appraisal processes in NOEs.

As these observations already imply, there is some controversy over the precise diagnostic criteria to differentiate between healthy and pathological NOEs. It is usually assumed that pathological NOEs tend to a) cause significant distress or impairment to the individual, b) are involuntary, and c) often incompatible with cultural norms and expectations (Delmonte et al., 2015; Moreira-Almeida & Cardeña, 2011). Such criteria may be useful in the evaluation of more extreme cases, yet they are typically insufficient to precisely differentiate healthy and pathological functioning in specific cases. Some evidence suggests that evaluating a nonordinary experience as pathological partially depends on whether the experience is understood as such in a given context, that is, on the available cultural criteria to define what is pathological and what is not in a given situation.

If cultural criteria play a role, this nevertheless makes the classification criteria more culturally relative, as the negative/abnormal character of NOEs evaluations may vary considerably from one cultural context to another (Maraldi & Krippner, 2019), as well as from one historical moment to the next (Luhrmann, 2005, 2020). On the other hand, some authors suggest that despite the sociocultural variability in the way NOEs are appraised, we might still be able to find substantial cross-cultural consistency in terms of both the phenomenology and the neurophysiological patterns of such experiences (Hood, 2016; Winkelman, 2011).

Responding to these debates, Moreira-Almeida and Cardeña (2011) argued that it is possible to achieve reliable cross-cultural criteria to assist in distinguishing between pathological and non-pathological NOEs. According to their guidelines, a healthy experience involves most (though not necessarily all of) the following characteristics: 1) absence of psychological suffering; 2) absence of social and occupational impairments; 3) the experience is short-lived and occurs

episodically; 4) there is a critical attitude about the objective reality of the experience; 5) compatibility of the experience with cultural or religious beliefs, practices, and norms; 6) absence of psychiatric comorbidities; 7) the experience can be controlled by the individual, and 8) the experience promotes personal growth and is often directed towards helping others.

The main contribution of Moreira-Almeida and Cardeña's criteria is that their review identifies and combines a series of previously suggested recommendations into a single list. Nevertheless, only four of the characteristics proposed by the authors found empirical support in a further study conducted by Menezes Jr. et al. (2012) with attendees of a Brazilian spiritist center: absence of socio-occupational impairments, compatibility with a religious group or cultural norms, short and episodic manifestation, promotion of personal growth and care towards others. The remaining criteria in the original list did not prove relevant for the characterization of potentially healthy NOEs. In this sense, well-controlled studies in more diverse settings are needed to help evaluate existing criteria in terms of their cross-cultural consistency and clinical usefulness.

A further challenge in this research area is to identify exactly when and under what circumstances nonordinary experiences may become pathological. The most important conclusion to date is that such differentiation cannot be achieved solely at the level of the experience but requires a deeper understanding of the underlying factors and conditions for each individual or group. One common approach has been to investigate differences in reported NOEs between clinical and non-clinical groups and then to identify potential correlates of these experiences. These investigations have shown that spiritual individuals and members of the general population usually evidence a low frequency of mental disorders and psychopathological indicators, despite reporting experiences deemed psychotic and dissociative by psychiatrists and psychologists (Bastos et al., 2020; Damiano et al., 2021; Facco et al., 2019; Flor-Henry et al., 2017; Moreira-Almeida et al., 2006; Pederzoli et al., 2022; Peres et al., 2012; Stifler et al., 1993; Vencio et al., 2019).

General population samples also tend to report less threatening (e.g., paranoid, personalising) appraisals in comparison to psychotic patients (Peters et al., 2017; Underwood et

al., 2016, 2021). ~~Supporting psychiatric interpretations though,~~ However, Bell et al. (2006) found that participants from the general population tend to report psychotic experiences (such as auditory hallucinations) less often than psychotic patients. Nevertheless, the phenomenological characteristics of NOEs were more varied among the non-clinical compared to the clinical group. Unterrasner et al. (2017) reported that in healthy individuals, NOEs are indicative of reduced functioning, as reflected by increased psychological burden and lower educational achievement. Overall, this evidence is mixed, although the larger number of studies suggest that NOEs in the general public are not be associated with impairments.

Zooming in on specific differences between populations that may explain this difference; Fach et al. (2013) found that the experiences reported by clients seeking advice for dealing with NOEs in clinical settings were not only more frequent, but significantly more intense than those reported by members of the general population (see also Coelho et al. (2008) for similar findings). It is unclear at present whether this is because pathological processes make the experience more intense or because intense and frequent NOEs eventually lead to a pathological reaction. Maybe both mechanisms are involved and establish a feedback relationship (in this respect, see also Sakakibara, 2019).

Individuals reporting psychotic experiences also tend to show greater conviction in relation to the experience, as well as feelings of grandiosity, paranoia, emotional problems, jumping to conclusions bias, and a history of negative life events and bullying (Anilmis et al., 2015; Hassanali et al., 2015; Ruffell et al., 2016). In other words, nonordinary experiences in some populations may be side- or collateral effects of other psychological and cognitive problems, which raises questions about the underlying mechanisms that tie experiences and psychological or cognitive features together.

Returning to the importance of appraisals, predictors of lower distress regarding psychotic experiences can include ‘spiritual’ appraisals, social support, and greater controllability (Brett et al., 2014). Overall, “the findings suggest that distress is reduced by developing normalizing and validating contexts in which psychotic experiences can be accepted, understood, and shared” (Brett et al., 2014, p. 213). In fact, Brett et al. (2009) have observed that the differences between

clinical and non-clinical groups might result less from psychotic experiences per se and more from the fact that at-risk individuals evidence elevated levels of general psychopathology and comorbidities.

One further problem with studies comparing clinical and non-clinical samples is that they tend to disregard the fact that even among clinical groups not all experiences are perceived as pathological. Hence, associations might be more complicated and require more than simply comparing clinical vs non-clinical groups. This becomes evident when examining how mental patients attempt to make sense of their own experiences. For the patients diagnosed with bipolar disorder interviewed by Ouwehand et al. (2014), it was important to ascertain whether their experiences were "authentic" spiritual phenomena or by-products of their psychiatric condition, which could vary from one experience to another (see also Eeles et al., 2003 and Sanderson et al., 1999).

One important point going forward is that researchers should take into consideration criteria and practical guidelines developed by religious leaders and spiritual counselors within their respective contexts (DeHoff, 2015). Religious leaders tend to evaluate pathology in terms of experiences that cause suffering or impairment, while non-pathological NOEs are regarded as positive in relation to religious values and ideals such as reports of spiritual healing, seeing and talking with spiritual beings to obtain guidance, seeing a bright, white light, and sensing a presence of love. Despite endorsing spiritual explanations, religious believers and experiencers are not necessarily biased towards supernatural attributions and may often consider natural causes for experiences allegedly involving nonordinary phenomena (Driscoll, 2013; Guthrie & Stickley, 2008; Perez, 2019).

Finally, we identified a significant body of literature on the differential diagnosis between pathological and healthy NOEs driven by theoretical perspectives (Brett, 2002; Dein, 2010, 2017; Evrard, 2013, 2014; Fulford & Jackson, 1997; Harrison, 2009; Johnson & Friedman, 2008; Lukoff, 1985; Margolis & Elifson, 1983; Marzanski & Bratton, 2002; Maurano & Albuquerque, 2019; Ojalammi, 2019; Phillips III et al., 2009; Pierre, 2001; Pirta, 2014; Rashed, 2010; Saver & Rabin, 1997; Taves & Barlev, 2022; Woods & Wilkinson, 2017). As these discussions were

typically removed from empirical findings, we did not delve further into these points because a more detailed analysis of these theoretical arguments would have moved beyond the scope of our systematic review of empirical links between NOEs and mental health. We strongly recommend interested readers to consult these sources.

Concluding remarks

Summary of main findings

The main purpose of the present study was to provide a systematic review of research on NOEs and mental health. Overall, the studies reviewed suggest that the relationship between NOEs and mental health is complex, varying according to a series of psychological and social factors. In particular, they suggest that appraisal processes play a fundamental role in the mental health outcomes of these experiences. Still, many other factors ranging from personality differences to religious involvement and psychophysiological markers appear relevant and should be investigated in future research. All these factors may interact in complex ways and disentangling them will require the development of transdisciplinary research programs. It remains unclear when and under what circumstances NOEs may become pathological. Further research is needed to identify the individual, social, and/or neurobiological factors that may help differentiate healthy from unhealthy or maladaptive experiences.

Limitations of our study

Our findings are limited to research that is easily captured using traditional forms of literature searches. In our search, we used the most common terms based on our familiarity with the psychological literature, balancing breadth and specificity. Authors across different fields may have used other keywords that we missed in our search. Future reviews should consider including a broader set of specific keywords or variations of existing keywords with the aim of uncovering empirical research that is specific to certain experiences. Having completed our review, for example, more specific keywords focusing on out-of-body experiences and hallucinations might be useful to include in future studies.

Second, our search may also have missed books, monographs and reports that are not included in the databases that we searched. In response to both the keyword and database limitations, we searched references in the articles included in our review. However, it may not always be obvious which references may include relevant empirical data. Third, even though no constraint of date or language was adopted in our search, searching databases in English may have restricted our ability to identify relevant studies in other languages. We did search for further studies in the reference list, seeking to identify articles in English, Portuguese, Spanish, French and German that our team seemed relevant. However, there might be additional studies published in other languages which we were not able to identify in our search. As noted in a recent review of research on rituals (Fischer, 2022), there are active research fields in other languages that are often neglected in reviews and bibliometric studies due to predominance of English as a lingua franca. Fourth, the notions of health and mental illness have evolved substantially over the past century. For example, the emergence of diagnostic manuals, changes in diagnostic categories, and advances in our understanding of mental health may have changed how researchers investigate and describe relevant phenomena. The studies covered in our review span roughly 40 years of research. Although we considered broad temporal trends in the analysis of the instruments, it was beyond our scope to explore temporal patterns more carefully. We encourage future research to analyze in more detail how temporal changes on macro-level research trends as well as more nuanced analyses of published research (e.g., the specific terminologies used and evaluative statements). Finally, we strongly encourage pre-registration of future systematic reviews in this area.

Recommendations for future research

Based on our review of the evidence, we conclude with some recommendations for future research on NOEs, wellbeing and mental health. The main points are as follows:

1) More attention should be paid in future research to the overlap between NOEs and well-being or psychopathological constructs. We recommend that researchers score items assessing positive emotions and symptoms such as fear and anxiety separately in order to

reduce conceptual confusion between variables, thus allowing for a better understanding of the psychological factors affecting NOEs.

2) We call for studies that use a subject-defined definition in order to investigate the implications of particular experiences to mental health.
3) We suggest avoiding overall constructs, such as "mysticism", "paranormal" or "schizotypy", and total scores when dealing with diverse sets of experiences. Specific NOEs may show highly distinct patterns with respect to wellbeing and mental health, which will be obscured by examining total score correlations. There might be exception to this rule, if it is possible to define a common set of NOEs and then create a sum score to indicate individual differences in overall sensitivity or propensity to NOEs.
4) It is also important to ensure that items are understood as intended by the populations surveyed, which implies that greater effort should go into the application of systematic procedures around content validity and cultural adaptation.
5) Given the paucity of measures developed specifically for children and/or adolescents (e.g., Laurens et al., 2012), we recommend further study of NOEs among different age groups, as well as research tapping on age of onset and associated conditions (e.g., psychotic disorders). This line of investigation is essential for shedding light on possible developmental factors associated with beneficial or detrimental aspects of NOEs.
6) We urge a clearer separation of experiences and appraisal processes in the assessment process, including clearer assessment of how these experiences can be controlled by the individual and how it impacts their daily functioning, more detailed assessment of the frequency, duration, controllability and general context of the experiences.
7) Similar to the unpackaged NOE concept, wellbeing components and domains differ. It would be useful to work towards greater differentiation of the specific domains of subjective wellbeing and mental health.
8) We were surprised by the relative lack of longitudinal work in larger (non-clinical) populations or clinical work following individual patients. For a greater understanding of the NOE-wellbeing link, it is essential to conduct more and better longitudinal work that

examines the frequency and duration as well as the developmental dynamics over time to give us both better descriptive information on the phenomena and offer opportunities for therapeutics and mental health intervention, if necessary.

9) Our review suggested that individual differences are fundamental for understanding the NOE-wellbeing associations. This calls for more targeted examinations of broader psychological profiles and individual difference or situational variables that may influence how NOEs and mental health and wellbeing may be related.

10) Our research team, which brought together scholars of religion, psychology, biology and health has demonstrated to us the fruitfulness of discussing ideas across disciplinary boundaries. We hope to see more transdisciplinary dialogue involving psychiatrists, religious authorities, mental health professionals, anthropologists, psychologists, legal scholars, neuroscientists and other researchers with an interest in these phenomena to provide a more holistic and multifaceted understanding of the phenomena and possible implications and applications.

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