

The MHQ Dimensions: A Multidimensional Profile of the Mental Health Quotient

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Abstract

The Mental Health Quotient (MHQ) or Mind Health Quotient is a population metric of mental health & wellbeing or **Mind health**, a term we use to better reflect the definition of the ability to navigate life's challenges and function productively. It is constructed from 47 items spanning the cognitive, emotional, social, and physical functions that determine a person's capacity to navigate everyday life (Newson, Sukhoi, & Thiagarajan, 2024). While the aggregate MHQ score provides a single, functionally linear readout of overall mental wellbeing, it does not on its own indicate which facets of function are driving that outcome. Here we describe six MHQ Dimensions — Adaptability & Resilience, Drive & Motivation, Mood & Outlook, Social Self, Cognition, and Mind Body Connection — that decompose the MHQ assessment into interpretable functional profiles. Each dimension is constructed from a set of primary items that most directly drive it and a set of secondary or modulating items that contribute to it more indirectly, using the same nonlinear scoring algorithm and -100 to +200 scale as the overall MHQ. Because items can contribute to more than one dimension and are weighted according to their functional severity, the six dimension scores do not sum to the overall MHQ score; rather, each is an independent, comparably scaled representation of a distinct aspect of human function. We describe the rationale for this approach, the item composition of each dimension, and its intended use in profiling population and individual mental wellbeing.

1. Introduction

A single aggregate score, however well constructed, can only answer the question of how someone is doing overall — it cannot say why. The Mental Health Quotient (MHQ) was developed to provide a comprehensive, functionally grounded measure of population mental health & wellbeing or mind health, built from 47 items covering the cognitive, emotional, social, and physical capacities and problems that determine a person's ability to function and thrive (Newson, Sukhoi, & Thiagarajan, 2024; Newson & Thiagarajan, 2020). Its nonlinear scoring algorithm and -100 to +200 scale were explicitly designed so that movement at any point on the scale corresponds to an equivalent change in productive function, a property not shared by simple sum or average scores of the same items.

For research, clinical, and policy applications alike, however, an aggregate score is often not enough. Two individuals, or two populations, can arrive at the same overall MHQ score by very different routes — one struggling primarily with mood regulation, another with social connection, a third with sleep and physical restoration. Distinguishing between these profiles matters: it has bearing on the nature of a specific population, what kind of intervention is likely to help, which policy lever is likely to move the

needle, and which underlying driver is worth investigating further. This is the motivation for the MHQ Dimensions described here: a set of six functional domains, each scored on the same scale and with the same underlying logic as the overall MHQ, that give a more granular, actionable readout of where a person's or a population's mental wellbeing is being helped or hindered.

The six dimensions — Adaptability & Resilience, Drive & Motivation, Mood & Outlook, Social Self, Cognition, and Mind Body Connection — were identified as coherent, interpretable clusters of function within the 47-item MHQ assessment. Each is built from a set of primary capacities and problems that most centrally define and drive it, together with a set of secondary or modulating capacities and problems that contribute to it in a supporting role. Because many of the 47 items are relevant to more than one aspect of functioning, some items appear as primary drivers of one dimension and as secondary, modulating contributors to another; a smaller number of items are primary to only a single dimension. This overlap is intentional rather than a limitation to be engineered away: everyday functional domains are not neatly partitioned in the mind, and a dimensional structure that reflects this interdependency is more faithful to how mental function actually operates than one that forces strict orthogonality.

It follows directly from this construction that the dimension scores are not components of an additive decomposition of the MHQ. They are not designed, and should not be used, to 'add up' to the overall MHQ score. Instead, each dimension score is computed independently using the same type of algorithm used to construct the aggregate MHQ metric — threshold-based rescaling of item ratings, differential nonlinear weighting by functional severity, and normalization onto a common range — which places every dimension score on the identical –100 to +200 scale as the MHQ itself (Newson, Sukhoi, & Thiagarajan, 2024). This shared scale is what makes the dimensions useful as a profile: a Mood & Outlook score of 40 and a Mind Body Connection score of 40 reflect a comparable degree of functional standing in their respective domains, and either can be compared directly to a person's or population's overall MHQ score, even though none of the dimension scores can be summed or averaged to reconstruct it.

2. Construction of the Dimension Scores

2.1 The MHQ assessment

The MHQ assessment rates 47 items of mental function using a 1–9 life-impact scale (Newson & Thiagarajan, 2020; Newson, Sukhoi, & Thiagarajan, 2024). Twenty-seven of these are capacity items, which have a bi-directional scale ranging from a negative impact (a real challenge to functioning) to a positive impact (a genuine asset), and twenty are problem items, which are unidirectional and range from never causing difficulty to having a constant, severe impact on functioning. Every MHQ Dimension is built exclusively from ratings on this same set of 47 items — no additional items are introduced at the dimension level.

2.2 Assigning items to dimensions

Each of the six dimensions is associated with two tiers of items. Primary capacities and primary problems are the items that most directly define and drive the dimension — for example, Stability & Calmness, Emotional Control, and Outlook & Optimism are primary capacities of Mood & Outlook, while Sadness & Hopelessness, Fear & Anxiety, and Traumatic Flashbacks are among its primary problems. Secondary, or modulating, capacities and problems are items that also bear on the dimension but do so more indirectly, often because they sit closer to the core of a different dimension — for instance, the items Self-Worth & Confidence and Self-Image act as secondary modulators of Mood & Outlook, reflecting the well-established interplay between self-regard and emotional steadiness, without displacing emotional regulation items as the dimension's primary drivers.

Because this assignment is based on functional relevance rather than mutual exclusivity, a number of items recur across dimensions in different roles. Avoidance & Withdrawal, for example, is a primary problem for Mood & Outlook but a secondary, modulating problem for Adaptability & Resilience, Drive & Motivation, and Social Self alike — consistent with withdrawal being a common downstream consequence of difficulty in several distinct functional domains. Most items, however, are primary to only one dimension. A related pattern is that some items share their name with the dimension they most centrally define — for example, the item Drive & Motivation is the leading primary capacity of the Drive & Motivation dimension — while also appearing as a secondary, modulating item within other dimensions.

2.3 Scoring algorithm

Dimension scores are constructed using the same type of nonlinear algorithm used to construct the overall MHQ metric (Newson, Sukhoi, & Thiagarajan, 2024). In brief, this involves: (i) a threshold-based rescaling of each item's 1–9 rating onto a negative-to-positive scale, with the threshold set according to the item's functional severity; (ii) a differential nonlinear transformation that amplifies negative scores more strongly for items of higher functional severity, so that, for example, a negative rating on a higher-severity item contributes more heavily to a lower dimension score than an equally negative rating on a lower-severity item; and (iii) normalization of the resulting distribution onto a –100 to +200 scale, with the negative and positive sides of the distribution normalized separately. This algorithm is applied to the set of items — primary and secondary, capacities and problems — associated with each dimension.

Applying the same algorithmic logic at the dimension level as at the aggregate level preserves the properties that distinguish the MHQ from a simple sum score: dimension scores are not driven merely by how many items are rated poorly, but by which items are rated poorly and how severe their functional consequences are. It also means that a given dimension score can be interpreted using the same distressed-to-thriving framing used for the overall MHQ, even though the two are computed from different, only partially overlapping, sets of items and are not arithmetically related.

2.4 Relationship to the overall MHQ score

Two features of this construction are worth stating explicitly. First, the dimension scores do not sum, or average, to the overall MHQ score. The MHQ is computed from all 47 items considered together; each

dimension score is computed from a different subset of those items, with item overlap across dimensions and item-specific severity weighting that differs from one dimension to the next. There is therefore no arithmetic relationship, additive or otherwise, between the six dimension scores and the aggregate MHQ. Second, despite this, all seven scores — the six dimensions and the overall MHQ — sit on the same –100 to +200 scale, constructed via the same type of nonlinear transformation and normalization. This means dimension scores can be meaningfully compared to one another and to the aggregate MHQ score in absolute terms, to identify, for instance, that a given population's Mind Body Connection is substantially lower than its Drive & Motivation, or that a decline in the overall MHQ over time is concentrated in Mood & Outlook rather than distributed evenly across all six dimensions.

Box 1. Changes to the Dimensions and Scoring Since 2021

The dimensions and their scoring have evolved since they were first introduced. Key changes include:

1. The original Newson et al. (2020) JMIR Mental Health publication initially indicated that the dimensions were scored on a –50 to +100 scale. This was later changed in 2021 so that dimension scores are instead mapped onto the same –100 to +200 scale used for the overall MHQ, as described in Section 2.3 above.
2. Initially, two separate cognitive dimensions were defined — Cognition and Complex Cognition. These were collapsed into the single Cognition dimension described in Section 3.5 in 2021, and dimension scores were recalculated in the Global Mind Database to reflect this change. In addition, the Adaptability & Resilience dimension described in Section 3.1 was added after the dimensions were first introduced.
3. Some items in Mood & Outlook and Mind-Body Connection were recently modified (July 2026). This involved removing one or two modulating items, such as Energy Level, from Mood & Outlook. Energy Level was originally included as a factor of depression; it was removed because Mood & Outlook is intended as a dimension of human capacity that is distinct from disorder symptoms. These changes are reflected in the new online score calculator, and new scores are now added into the Global Mind Project on Brainbase alongside the old scores. Recalculation of old scores is ongoing and will be populated as it is completed. These changes result in less than a 3-point change for the majority of people; however, in a small percentage (<5%), there may be differences of >10 points.

3. The Six MHQ Dimensions

The sections below describe each of the six dimensions and list its associated primary and secondary/modulating capacities and problems, as derived from the MHQ item set.

3.1 Mood & Outlook

The ability to manage and regulate one's emotions effectively and to sustain a constructive, optimistic outlook toward the future (Sapien Labs, n.d.-c).

	Primary	Secondary / Modulating
Capacities	Stability & Calmness; Emotional Resilience; Emotional Control; Outlook & Optimism	Self-Worth & Confidence; Self-Image
Problems	Sadness & Hopelessness; Fear & Anxiety; Avoidance & Withdrawal; Mood Swings; Nightmares; Anger & Irritability; Guilt & Blame; Traumatic Flashbacks	Aggression Towards Others; Suicidal Thoughts or Intentions

3.2 Social Self

How a person perceives, relates to, and interacts with others, encompassing relationship-building, communication, and empathy (Sapien Labs, n.d.-d).

	Primary	Secondary / Modulating
Capacities	Self-Worth & Confidence; Relationships with Others; Physical Affection & Intimacy; Social Interactions & Cooperation; Empathy; Self-Image	Speech & Language; Planning & Organisation
Problems	Aggression Towards Others; Sense of Being Detached from Reality; Suicidal Thoughts or Intentions	Avoidance & Withdrawal; Anger & Irritability; Guilt & Blame

3.3 Adaptability & Resilience

The capacity to adjust one's behavior and outlook as circumstances change, and to cope with and recover from the challenges and setbacks encountered in daily life (Sapien Labs, n.d.-a).

	Primary	Secondary / Modulating
Capacities	Adaptability to Change; Creativity & Problem Solving; Ability to Learn; Emotional Resilience	Drive & Motivation; Planning & Organisation; Curiosity, Interest & Enthusiasm; Outlook & Optimism
Problems	—	Avoidance & Withdrawal; Sadness & Hopelessness; Confusion or Slowed Thinking

3.4 Drive & Motivation

The capacity to work toward one's goals, and the interest, persistence, and energy needed to initiate, sustain, and complete the activities of daily life (Sapien Labs, n.d.-b).

	Primary	Secondary / Modulating
Capacities	Drive & Motivation; Curiosity, Interest & Enthusiasm	Adaptability to Change; Decision-Making & Risk-Taking; Energy Level; Appetite Regulation; Outlook & Optimism
Problems	Addictions; Repetitive or Compulsive Actions	Avoidance & Withdrawal

3.5 Cognition

The ability to carry out basic cognitive functions — such as attention, memory, and learning — make sense of complex situations, and bring a longer-term perspective to one's thoughts and behavior (Sapien Labs, n.d.-e).

	Primary	Secondary / Modulating
Capacities	Creativity & Problem Solving; Self-Control & Impulsivity; Ability to Learn; Speech & Language; Memory; Decision-Making & Risk-Taking; Focus & Concentration; Sensory Sensitivity; Selective Attention	Coordination; Curiosity, Interest & Enthusiasm
Problems	Restlessness & Hyperactivity; Unwanted, Strange or Obsessive Thoughts; Hallucinations; Confusion or Slowed Thinking	Addictions; Repetitive or Compulsive Actions

3.6 Mind Body Connection

The regulation of the balance between mind and body, reflecting the overlap between mental and physical health (Sapien Labs, n.d.-f).

	Primary	Secondary / Modulating
Capacities	Sleep Quality; Coordination; Energy Level; Appetite Regulation	Stability & Calmness; Sensory Sensitivity
Problems	Susceptibility to Infection; Experience of Pain; Physical Health Issues	Restlessness & Hyperactivity

4. Discussion

The MHQ Dimensions extend the utility of the MHQ assessment beyond a single aggregate readout, providing a functional profile that can identify which aspects of mind health are driving an observed level or change in mind health. This has practical value across the contexts in which the MHQ is already applied: in population monitoring, a decline in aggregate MHQ scores can be examined dimension by dimension to determine whether it is concentrated in, for example, Mood & Outlook or Mind Body Connection, pointing toward different candidate drivers and different intervention targets; in clinical and organizational settings, a dimensional profile offers a more actionable starting point than a single score for designing or targeting a response.

The overlapping structure of the dimensions — in which certain items act as primary drivers of one dimension and secondary modulators of another — is a deliberate design choice rather than a psychometric shortcoming to be resolved. Mental function does not decompose into cleanly independent domains: mood and outlook draw on self-worth, adaptability draws on drive and motivation, and cognition draws on the physical substrate provided by sleep and coordination. A dimensional structure that reflects these dependencies, rather than forcing artificial independence, is more consistent with how these functions actually operate together in everyday life. The direct consequence of this design is that the six dimension scores cannot, and are not intended to, sum to the overall MHQ score; they should instead be read as six complementary, comparably scaled windows onto the same underlying construct of mental wellbeing that the MHQ measures in aggregate.

4.1 Limitations and future work

As with the MHQ itself, the dimension scores are derived from self-report and share the same general limitations described for the aggregate metric, including reliance on subjective ratings and the demographic characteristics of the samples from which the MHQ assessment has so far been validated (Newson, Sukhoi, & Thiagarajan, 2024). Because the dimensions are new, their individual psychometric properties — including their relationship to independently measured functional outcomes, their stability over time, and their invariance across age, geography, and culture — have not yet been established to the same extent as for the aggregate MHQ, and represent a priority for future validation work. It will also be valuable to examine whether the linear relationship between MHQ scores and functional productivity demonstrated for the aggregate metric holds, and takes a similar form, within each of the six dimensions individually.

5. Conclusion

The six MHQ Dimensions — Adaptability & Resilience, Drive & Motivation, Mood & Outlook, Social Self, Cognition, and Mind Body Connection — provide a functional profile beneath the aggregate Mental Health Quotient score. Built from the same 47-item MHQ assessment and scored using the same nonlinear algorithm and -100 to +200 scale as the overall MHQ, they allow direct, comparably scaled interpretation of six distinct aspects of mental function. Because dimensions share items and are weighted individually by functional severity, they are not additive components of the MHQ and do not sum to it; rather, each represents an independent best estimate of a coherent aspect of human functioning, together

offering a more granular and actionable view of population and individual mental wellbeing than the aggregate score alone.

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