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# The Chicago Hallucination Assessment Tool

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User Guide

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**Chicago Hallucination Assessment Tool (CHAT)**

Summary

- CHAT is a 30 minute semi-structured interview designed to quantify dimensions of hallucination severity.
- CHAT overlaps and expands the gold-standard PSYRATS-AH (Haddock et al., 1999) which assesses severity of auditory hallucinations by rating aspects of hallucinations with scales of 0-4.
- Can capture Current (last couple of days) and/or Past/Worst hallucination experiences in each modality.
- Conceptualizes “Severity” along 3 dimensions and provides scores for each dimension as well as a total score for each sensory modality, at different time points if desired.

Dimensions of Hallucination Severity:

1. Physical
2. Cognitive
3. Emotional

Sum 1-3 for Total Severity score

- Can capture treatment response history and other hallucination characteristics, if desired.

## About the CHAT

The Chicago Hallucination Assessment Tool (CHAT) is a semi-structured interview designed to gather quantitative, and optionally qualitative, information regarding the severity of hallucinatory experiences. The target population for its use is psychiatric patients. The CHAT is structured in two primary parts. The first is a series of screening questions for hallucinatory experiences in each sensory modality to determine which types of unusual perceptual experiences across the five senses may be hallucinations and should be assessed further. Second, follow-up questions solicit detailed information to help clarify whether experiences are hallucinations and then to quantify their severity. Severity is quantified within each sensory modality as a sum of the item scores, and can also be broken down to scores along three dimensions: Physical, Cognitive, and Emotional severity.

Conceptually, the CHAT implements the notion that multiple sensory modalities should be assessed for hallucinatory experiences, as is the case in the Scale for the Assessment of Positive Symptoms (SAPS, Andreasen, 1984). The CHAT combines this with the detailed severity assessment approach for a specific symptom, as implemented in the Psychotic Symptom Rating Scales (PSYRATS, Haddock et al., 1999). CHAT items draw from and build on the PSYRATS-Auditory Hallucination scale. The CHAT is not designed to be highly sensitive to very occasional, unusual perceptual experiences such as may be closer to normative experiences across the entire adult population. On the other hand, some information about such experiences may be captured by the CHAT.

Additional key features of the CHAT include options to rate current and past/worst experiences with hallucinations, treatment responsiveness, chronicity, and to gather data on a range of qualitative features of hallucinatory experience.

## Defining Hallucination

For the purposes of the CHAT, a hallucination is defined as a “sensory perception that has the compelling sense of reality of a true perception but that occurs without external stimulation of the relevant sensory organ” (American Psychiatric Association, 1994, p.767). An interviewee’s level of insight, level of intelligence, and verbal expression abilities should be taken into consideration when evaluating descriptions of possible hallucinatory experiences. Raters should be mindful of over-pathologized descriptions of normal perceptions (e.g., thinking one’s name has been called when it has not) as well as minimized accounts of hallucinatory experiences by patients with limited insight, paranoia, or other reluctance to report an experience. The CHAT does not require a diagnosable psychiatric condition to be identified in order for an individual to report what may be classified as a hallucination, and unusual perceptual experiences rated on the CHAT may or may not clearly be hallucinations. The CHAT includes a place where the rater can record a judgment about the probability of a reported experience being a hallucination as defined here, but this does not impact the ratings themselves. Users of this instrument may wish to make a determination of how to incorporate such decisions into their use of the scale.

Similar to many symptom rating scales, the CHAT is not a test with established normative scores to help establish diagnoses, degree of abnormality, or other clinically-

relevant constructs. Rather, the CHAT provides a quantitative score designed to describe severity of hallucinations that may be useful for a variety of research purposes.

### **Interviewer Qualifications**

The interviewer/rater should have clinical training and experience working with individuals with psychiatric illnesses. The critical skills needed include familiarity with psychiatric symptoms, and capacity to listen to patients describe their symptoms and assess such descriptions against objective criteria, similar to skills utilized in the diagnostic process or with other symptom severity assessments. Competent CHAT raters will know how to 1) probe for additional information to determine the appropriate rating for a given item, and 2) rephrase a question to allow different interviewees to understand the intent of the question, consistent with the concept of a semi-structured interview. Further, the interviewer should have appreciation for individual differences and variation in how hallucinations, as with many psychiatric symptoms, may be understood, labeled, or talked about by those experiencing them.

### **Severity Scales of the CHAT**

A principle feature of the CHAT is to operationalize “hallucination severity” by scoring along three dimensions: Physical, Cognitive, and Emotional. The Physical dimension includes items related to the physical characteristics of a hallucination, such as frequency, duration, and intensity. The Cognitive dimension includes items related to interference with cognitive processes, such as the ability to concentrate when hallucinations occur. The Emotional dimension includes items related to one’s emotional state during a hallucination as well as the severity of negative emotional valence of the hallucination itself. The total of these dimensions represents an overall severity level. The three dimensions were empirically determined as the factors comprised by items in the PSYRATS (Haddock et al., 1999). Items in the CHAT specific to auditory hallucinations partly overlap with PSYRATS auditory hallucination items, and the 0-4 scoring structure of PSYRATS has been implemented in CHAT severity items. However, these 3 dimensions may or may not be the optimal approach (Woodward et al., 2014), so researchers may wish to devise alternative dimensional categories from CHAT items.

### **Multiple Sensory Modality Assessment**

The meaning of having hallucinations in one modality versus more than one modality, or one modality versus another, is not known. The CHAT can yield scores for each sensory modality in which interviewees report having hallucinations. This feature of the CHAT supports efforts to further understand symptom heterogeneity. This also permits flexible usage, such that a researcher may only inquire about a selected group of sensory modalities. When considering scores across sensory modalities, however, it is important to note that *there is slight variation in the number of items for the Physical severity subscale across the modalities (see Summary Score Sheet where this is most clearly laid out)*. Hence, in addition to the unclear nature of having one, two, or several types of hallucinations, the absolute value of the CHAT scores for each modality are not comparable due to the discrepancy in number of items. Conversion of raw scores to a

percentage of total possible points would be one way to make the scores across modalities comparable, if desired. Next, it is not clear that adding scores ACROSS sensory modalities (such as Current Auditory Hallucination Severity + Current Visual Hallucination Severity) is meaningful, nor that adding scores for Current and Past/Worst is meaningful within a sensory modality, and therefore such totals are not included on the Summary Score Sheet or advised.

### **Time Frame**

The CHAT is designed to assess both current and past hallucination severity, and it is optional to select only one of these, or to use both.

For Current severity, interviewees are directed to think of “the last couple of days.” The Current rating is intended to assess the person’s ongoing hallucinatory experience around the time of the interview. The phrase “last couple of days” may be interpreted differently by different people, but is a reasonable selection given variation people will have in their ability to accurately remember experiences under a more rigid-sounding time boundary, such as “last 48 hours.”

Past/Worst ratings are recommended to refer to the time period when the interviewee felt the most distressed by hallucinations or when hallucinations seemed to cause the most problems. The intent is to capture the height of hallucination severity that the person has ever subjectively experienced, which may be useful, for example, in determining underlying pathology severity irrespective of treatment responsiveness. If the current time is also considered by the interviewee to be the worst time, then the current and past ratings will be identical.

### **Selecting One Hallucination Within a Modality**

If the interviewee reports multiple hallucinations within a modality, select only the most significant one to rate, i.e., that which is most frequent, dominant, bothersome, etc. Information about the occurrence of hallucinations NOT rated can be captured in the Chronicity Rating Page (further instructions under “Administration Instructions”).

### **Sources of Information for Ratings**

There is no specific recommendation regarding source of information to be used beyond the interview itself. If collateral information is available, it can be combined with the information elicited from the interview to make the ratings. The sources of information used to inform the rater’s judgment can be indicated at the top of the Screening and full Follow-up forms. In general, raters should use their judgment to assign scores to items.

## ADMINISTRATION INSTRUCTIONS

### Overview

The CHAT sections are:

1. Preliminary Questions
2. Modality Screening
3. Follow-up
  - a. Lifetime History
  - b. Severity Scales
  - c. Substance Use
  - d. Medication Effects
  - e. Additional Qualitative Items
4. Impression
5. Chronicity

Each user must decide which sections to use to suite their purposes.

All items on the CHAT should be asked verbatim initially. Such parts are printed in **bold** on the CHAT forms.

### Guidelines for Each Section:

1. **Preliminary Questions:** Optional section. Raters must ensure that rapport has been built prior to administration of the CHAT, such as would occur in a clinical or assessment interview involving diagnostic instruments. If the CHAT is the first instrument being administered, Preliminary Questions should be asked to assist in the rapport-building process and begin gathering pertinent general information. Some or all may be asked. Additional rapport-building questions may be asked as needed. The Preliminary Questions do not contribute to any CHAT score.
2. **Modality Screening:** These are sets of screening questions for the following sensory modalities: Auditory, Visual, Olfactory, Tactile, and Gustatory. Each set begins with questions related to more common misperceptions and ends with questions associated with more pathological experiences. The screening questions are used to assess whether an individual has *ever* experienced a hallucination or other type of perceptual abnormality that is outside normal limits. Items from each set of screening questions for each sensory modality must be administered, but can be discontinued once the interviewer is convinced there is sufficient indication that the interviewee has experienced probable hallucinations and that the follow-up questions will be asked for that modality. Similarly, if previous clinical interview or rating instruments were administered which already revealed probable hallucinatory experiences, then the screening module can be skipped altogether. A box at the top of the screening module allows for recording of any sensory modality hallucinations already reported, in which case CHAT screening questions for that modality are not needed.

Conversely, all questions from each screening module should be asked if the interviewee continues to indicate no probable hallucinatory experiences. If an interviewee's responses on screening questions suggest probable hallucinatory experience, or if it is unclear, then the follow-up questions should be asked as this may help clarify whether their experience is hallucinatory.

3. **Follow-up:** Administer the follow-up question sets indicated from the Modality Screening. The core follow-up questions are the Lifetime History and the Severity Scale items. If only this quantified information is desired, the CHAT-Lite form can be used.

- a. Lifetime History

In this section, the onset and recency of hallucinatory experiences is ascertained, as well as a sense of the number and characterization of different types of experiences within the sensory modality. This section helps raters determine which experiences will be assessed for the severity scale items.

- b. Severity Scale Items

Follow-up questions include 3-6 questions per severity subscale (Physical, Cognitive, Emotional) and should be rated according to the criteria in each item. Tallies of scores from these items constitute the main quantitative severity ratings of the CHAT. These items are numbered by their sensory modality (AH, VH, etc.), subscale (P, C, or E for Physical, Cognitive, Emotional), and item number within the subscale.

- i. **Physical Severity:** Includes items such as Frequency, Duration, Sensory Intensity, Complexity, and Interference.
    - ii. **Cognitive Severity:** Includes items such as Interruption of Thought Processes and Controllability.

*Note:* The "Frequency of Control" item is recommended to carefully separate coping behavior from actual experience of "control." For example, putting on headphones to listen to music may be a method of coping, but is different from the experience of actually being able to mentally control the experience, which is what this item is intended to quantify. A question on what the participant is able to control, and a question on what an interviewee may do to cope, follows the "Frequency of Control" item to help clarify these concepts.

- iii. **Emotional Severity:** Includes Amount of Negative Content, Degree of Negative Content, Frequency of Negative Emotion Associated with Hallucination, and Intensity of Emotional Impact.

*Note:* The “Degree of Negative Content” item on the full CHAT (not the CHAT Lite) is followed by a check-box for “content is definitively pleasant” to help clarify when this occurs (item would be rated a 1 if yes, 0 if no). The “severity” of only “pleasant” hallucinations is unclear but can at least be recorded in this way.

Words and phrases from the different rating levels should be offered to interviewees to select a rating. Raters should feel free to clarify and follow-up for all portions of the CHAT to elicit the information needed.

Example 1:

Item AH-CDS1

INTERVIEWEE: “Yeah, I have a little trouble concentrating when I hear the voice.”

ADMINISTRATOR: “OK, so from the choices of ‘a little, a moderate amount, or a lot of trouble’ you would say...?”

INTERVIEWEE: “A little.”

Example 2:

Item VH-ESD2

INTERVIEWEE: “Sometimes the people standing there don’t seem evil.”

ADMINISTRATOR: “Would you say they seem evil more than half or less than half of the time?”

The full CHAT Follow-up form includes the Lifetime History and Severity items described above, along with additional sections that assess other information often of interest, including:

a. Substance Use

Assesses whether hallucinations occur only in association with substance use in that modality. The form advises to skip further follow-up questions if the hallucination does not occur except in association with substances, but this determination can be made by each CHAT user.

b. Medication Effects

Medication use and its effectiveness for hallucinations are assessed in this section, including qualitative information regarding what features of hallucinations improved, if any. Interviewees are then categorized in a manner adapted from the Clinical Global Impressions Improvement scale (Guy, 1976), ranging from responder-to-nonresponder, both currently and over the lifetime. Interviewees are not required to specify whether it was antipsychotic medication that seemed



helpful (or not helpful). However, the CHAT does presume this section on medication effects is largely related to antipsychotic medication given its indication for psychosis, which includes hallucinations. It also includes an option to indicate that antipsychotic medication has not been tried. Again, as with all sections and per discretionary use of each CHAT user, collateral clinical information may be considered in addition to self report for this section.

c. Additional Qualitative items

These are a series of items that allow further characterization of hallucinatory experiences. These are not scored or weighted in the severity dimensions, but may be of further clinical or research interest.

*Note:* The “Familiar/Unfamiliar” qualitative items are designed to assess whether the hallucination is personally relevant, e.g., is a voice of a family member, is a vision of something from childhood, is a scent from a specific memory. A hallucination is NOT considered familiar just because the participant possesses semantic knowledge of it, e.g., a voice identified as a supernatural entity such as God or the devil is considered not familiar for this item; a scent of rotting meat is not familiar, unless linked to a specific memory such as “it’s just like grandma’s barn which always smelled like rotting meat.”

4. **Impression**

After follow-up questions for each relevant sensory modality have been completed, interviewers can use this section to rate whether or not an interviewee’s reported experience constitutes a hallucination (see definition earlier in this Guide). The Impression is a judgment that provides categorization of the interviewee’s experiences as “definitely a hallucination” that may be useful for research or clinical purposes as fitting the definition of hallucination or not, as there can be cases in which it is not clear whether the unusual experience being described constitutes a hallucination or not until the end of the follow-up questions.

5. **Chronicity**

The Chronicity table allows an interviewee’s experiences to be rated as chronic, sparse, and/or once or twice, for each sensory modality. This serves as an additional manner of capturing hallucination heterogeneity. Raters should indicate all that apply, as within one modality someone may report both a chronic hallucination as well as a sparse one. For example, someone may report hearing a voice commenting in an ongoing way over many years as well as having heard dripping water a few times over the course of a few months. For this, a rater would circle 3 (“meets criteria”) in both the Chronic and the Sparse sections for Auditory, and would circle 1 (“no”) for the Once or Twice Auditory section. Hence, for each cell in the table, one number should be circled.

### **Order of Rating Current and Past/Worst**

There is no suggested rule regarding what order to rate different time points. Some interviewees may do better when going through all items for one time period, then revisit items while focusing on another time period (e.g., first rate past hallucination experiences, then current). However, some interviewees do better rating both current and past experiences simultaneously. Raters should use their judgment to select the best approach for each interviewee if both time points are desired.

### **Scoring the Severity Dimensions**

Transfer scores circled for each severity scale item to the Subscale Scoring Sheet. Totals can be compiled which comprise the scores for each dimension of severity (Physical, Cognitive, Emotional). These dimensional severity scores can be summed for a Total Severity score. Dimensional and Total scores are calculated for each time point (Past or Current) separately.

### Relation to PSYRATS-AH

The CHAT Auditory Hallucination scale for Current severity is highly similar to PSYRATS-AH and correlates highly with it ( $r = 0.9$ ). Differences were employed in the CHAT to improve conceptual consistency of the scale and to capture properties of hallucination experiences estimated to be associated with underlying neurobiological processes, although CHAT may be useful for other purposes, as well. Differences from PSYRATS include:

- 1) the CHAT has altered criteria relative to PSYRATS for assigning 0-4 for some items, to improve parallelization on CHAT items (e.g., a score of 0 on all items indicates an unqualified “not present”)
- 2) criteria alterations for each 0-4 score were altered in some CHAT items from PSYRATS items to ensure that higher numbers in each item indicate a more universally-agreed-upon indication that higher numbers are an increased in severity
- 3) the CHAT omitted some PSYRATS items that relate less directly to features of the hallucination experience

Specific departures from PSYRATS-AH, as generally described above, include:

1. Alteration of scoring criteria
  - a. Frequency item: In CHAT, a 0 indicates “not present” whereas for PSYRATS a 0 indicates “not present or present less than once a week”. CHAT moved “less than once a week” to receive a score of 1, and at least once a week to a 2, and so on.
  - b. Controllability item – 0 means “no hallucinations present” and 1 is the item to indicate “always has control.” CHAT calls this item “Frequency of Control.”
2. PSYRATS-AH items not in CHAT
  - a. “Location”
  - b. “Beliefs regarding origin of voices”
  - c. “Disruption to life”
3. CHAT items not in PSYRATS-AH
  - a. Intensity of the sensory nature of each experience (loudness, vividness, etc.)
  - b. Complexity (assessing the completeness of the experience as a percept)
  - c. Interference with other stimuli in that modality
  - d. Interruption of thoughts/concentration (ranges from none to severe)
  - e. Attentional demand (how difficult it is to ignore the experience)

To obtain a PSYRATS-AH score from the CHAT-AH Current severity items (which may be desirable for optimal comparison to prior studies), raters need only add on the 3 omitted PSYRATS-AH items and ensure that scoring of the PSYRATS-AH Frequency and Controllability items follows the PSYRATS-AH scoring scheme for them. All other

scores from CHAT-AH Current can be transferred to the comparable PSYRATS-AH item.

### **Limitations**

The CHAT is largely a self-report instrument and so with it come the usual concerns around reliability. Next, the CHAT focuses on quantifying a mental experience not directly observable by others, a departure from instruments such as the PANSS “hallucination behavior” item, which includes consideration of more objective observation (although not exclusively). Lastly, the range of features of hallucinatory experiences is not comprehensively captured by the CHAT. Additional important features may have been missed that are relevant to different type of research or clinical questions.

### **Psychometrics**

*See attached presentation, cite as:*

Kern et al., (2015) Exchange the magnifying glass for a microscope: The Chicago Hallucination Assessment Tool (CHAT). *Schizophrenia Bulletin*, 41(suppl 1), S110.

## REFERENCES

- Andreasen, N. C. (1984). Scale for the assessment of positive symptoms (SAPS) University of Iowa. *Iowa City, IA*.
- Guy, W. (1976). Clinical Global Impressions. In: ECDEU Assessment Manual for Psychopharmacology, revised. National Institute of Mental Health: Rockville, MD. pp 218–222.
- Haddock, G., McCarron, J., Tarrier, N., & Faragher, E. B. (1999). Scales to measure dimensions of hallucinations and delusions: The psychotic symptom rating scales (PSYRATS). *Psych Med*, 29(4), 879-889.
- Woodward et al. (2014). Symptom dimensions of the psychotic symptom rating scales in psychosis: A multisite study. *Schizophr Bull*, 40, S265-274.