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## **Inner reading voices: An overlooked form of inner speech**

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### **Abstract:**

Inner speech is theorized to be the basis for auditory verbal hallucinations (AVHs), but few empirical studies have examined the phenomenology of inner speech, particularly while reading. One hundred and sixty posts from a popular question and answer community website were analyzed using a qualitative content analysis approach, to examine the phenomenology of inner reading voices (IRVs). Results indicated that many individuals report routinely experiencing IRVs, which often have the auditory qualities of overt speech, such as recognizable identity, gender, pitch, loudness and emotional tone. IRVs were sometimes identified as the readers' own voices, and sometimes as the voices of other people. Some individuals reported that IRVs were continuous with audible thoughts. Both controllable and uncontrollable IRVs were reported. IRVs may provide evidence for individual variation in imagery vividness and support for inner speech accounts of AVHs. IRVs may be a useful model for studying AVHs in the non-clinical population and need further investigation.

### **Introduction**

Many theories propose that auditory verbal hallucinations (AVHs) are a form of inner speech that is misattributed to a source other than the self (Allen, Aleman & McGuire, 2007; Frith, 1992; Garrett & Silva, 2003; Jones & Fernyhough, 2007). Little literature exists on the phenomenology of inner speech (Heavey & Hurlburt, 2008; Hurlburt, 1990; Langdon, Jones, Connaughton & Fernyhough, 2009) or on individual differences in inner speech, although these appear to be considerable (Heavey & Hurlburt, 2008; Hurlburt, Heavey & Kelsey, 2013). With the notable exception of a phenomenological study that used Descriptive Experience Sampling (Hurlburt, Heavey & Kelsey, 2013), most research on inner speech has either not focused on its auditory qualities, or has assumed that it does not have auditory qualities such as gender, loudness, accent and identities distinct from the hearer. In fact, some writers draw a distinction between AVHs and inner speech on this basis (Wu, 2012).

Very little empirical research has examined the auditory quality of inner speech while reading (Perrone-Bertolotti et al, 2014). A few recent brain-imaging studies have shown that silent reading activates voice-selective areas in the auditory cortex (Perrone-Bertolotti et al, 2012; Yao, Belin & Scheepers, 2011). More evidence for heard inner speech comes from experimental studies (e.g. Alexander and Nygaard, 2008; Kurby, Magliano & Rapp, 2009) of auditory imagery, which is generally conceptualized as imagined speech (Linden et al, 2011; Shergill et al, 2001; Wu, 2012). Unfortunately, in most experimental studies (reviewed in Hubbard, 2010; 2013), evidence is not provided that participants generate imagery when instructed to do so, and individual differences in capacity to generate imagery are not taken into account. In fact, surprisingly little research has examined individual differences in vividness of

## Inner Reading Voices

auditory imagery (Hubbard, 2010). No studies have examined spontaneous, as opposed to experimentally elicited, auditory imagery while reading.

This paper reports on an archival study of spontaneous online reports of inner reading voices (IRVs). The research question addressed was: “What are the phenomenological characteristics of inner reading voices?”

### **Method**

The sample consisted of a subset of online posts drawn from a larger ongoing study of AVH phenomenology. The study was deemed exempt from ethical review by the Institutional Review Board at Felician College because only archived, publicly accessible data were collected, and no identifying information reported. The data were gathered from *Yahoo! Answers*, a community Q&A site website that encourages users to post anonymously, using screen names. Users post questions and answers on a wide variety of topics. *Yahoo! Answers* is the largest English language Q&A website in the world, with 200 million users and over one billion questions and answers by the end of 2009 (Jin, Zhou, Lee & Cheung, 2013). This website is just beginning to come under academic scrutiny as a rich source of data on online information-seeking (Moors & Webber, 2013; Lewis, Rosenrot & Messner, 2012). For the larger study on AVH phenomenology, the keyword “hearing voices” was used to search the *Yahoo! Answers* website. Relevant archived posts were extracted between February 13 and March 2, 2014. The earliest post was made 8 years prior to data collection, and the latest was made one week prior.

For the current study, a search was done *within* these “hearing voices” search results, using the truncation keyword “read\*.” A total of 160 posts were identified that contained references to IRVs, which were defined as inner voices experienced while reading. The identified posts were carefully read to ensure that they referred specifically to IRVs. Of the 160 posts, 24 were

## Inner Reading Voices

questions (posts that initiated discussion threads) and the remaining 136 were answers (responses to questions). Most answers were posted in response to questions that referred to IRVs, but 19 answers were responses to questions that did not refer to IRVs. The questions corresponding to these 19 answers were not included in the sample, but coders consulted them to understand the context of the answers. Questions ranged from a few sentences to a few paragraphs in length. Eleven answers were each four words or fewer in length, either agreeing or denying that an IRV was heard, or identifying a specific IRV (e.g. “my own voice” in response to a question about what kind of IRVs people had). The remaining answers ranged from one sentence to several paragraphs.

Two posts in the sample had the same username, and so were probably made by the same individual. Ten posts had a question mark or a period in place of a username. Comments made by *Yahoo! Answers* users suggest that these punctuation marks may be due to website glitches that prevent usernames from being seen, rather than being usernames themselves. The remaining posts all had different usernames, and so were likely made by different individuals, although this supposition cannot be confirmed.

The 160 posts were analyzed using a qualitative content analysis approach (Hsieh & Shannon, 2005; Schilling, 2006), in which texts are carefully examined and interpreted through a systematic process of identifying and coding themes and patterns. The units of analysis were posts. A coding manual, with operational definitions of codes, was created after a thorough reading of all the posts. Coding categories were derived primarily from the data, by selecting ideas that recurred in the posts, but the researcher’s familiarity with the published literature on AVH also aided in the formation of coding categories. An effort was made to include categories that would help explore phenomenological similarities and differences between IRVs and AVHs.

## Inner Reading Voices

The coding system was piloted on a subset of posts. Each post was independently coded by the author and one of three trained student assistants. Categories that were difficult to code were eliminated. For the remaining categories, agreement between the author and the independent coders was high, ranging from 82% to 100%. All disagreements were discussed until consensus was reached. Coding categories related to IRV frequency, number, identity and controllability, assumed presence of IRVs in others, similarity of IRVs to thinking, emotion expressed about IRVs, assumed normality of IRVs, and the auditory qualities of IRVs.

After coding, posts were grouped according to coding categories and examined for similarities and differences, and relationships between categories. Exemplar quotes were identified to illustrate codes. Spelling and grammar errors in posts were not corrected.

### **Results**

Of the 160 posts, 132 (82.5%) indicated that the person posting (hereafter termed the ‘poster’) heard one or more voice(s) while reading books, notes, online material or text messages, and 17 (10.6%) indicated that the poster did not hear a voice while reading (e.g. “I don't hear any voice... I just see the word/sentence , and understand what it is and what it means”). Coders were unable to determine whether IRVs were heard in 11 posts (6.9%) that referred to IRVs. All questions were posed by posters with IRVs (P-IRVs), while the 136 answers were offered by posters with IRVs as well as posters with no IRVs (P-NIRVs). Data relating to P-IRVs are summarized in Table 1.

Ten P-IRVs only noticed their IRVs when a question was asked (e.g. “Now, that you've mentioned it, I realize that I do hear a voice in my head”).

#### *Frequency of IRVs*

## Inner Reading Voices

A majority of P-IRVs heard IRVs regularly. For P-IRVs who heard IRVs only sometimes (13% of sample), precipitating factors included features of the text and its capacity to draw in the reader (e.g. “yeah sometimes i hear a voice in my head.. usually its when im reading a book/text that interests me...”), and the ability to easily recall particular voices (e.g. “[I hear] Usually my own [voice] although sometimes if I have been listening to a particular voice for a while (an actor/singer/parent/teacher etc) then I hear their voice reading it.”)

### *Number and identity of IRVs*

Almost half of P-IRVs heard only one voice, while others had more than one, sometimes including their own. Voices identified were those of book characters (e.g. “I hear the voice of like what I think the character would have”), senders or writers of messages (e.g. “...someone texts me, then when i read it, i can hear exactly the voice of the sender.”), celebrities (e.g. “...when I read the Godfather I heard the voices of the actors who played the characters in the movie), friends (e.g. “...I usually hear a friends voice that reminds me of the character of the story I am reading”) or relatives (e.g. “My grandpa.honest to god he used to read to me alot so sometimes I hear his voice”). Sometimes the IRV was an unidentified but familiar voice (e.g. “it's sort of tons of voices combined into one perfect, undistracting voice...”).

Some P-IRVs heard only their own voice. (e.g. “I don't believe I ever hear anybody else's voice besides my own...”). A few P-IRVs who identified their IRVs as their own indicated that the voices were different, in pitch, emotional tone, or some other quality, from their regular speaking voices (e.g. “yes! i hear my own vocie! but the vocie in my head doesnt sound like my vocie when i speak :o”). Sometimes the poster’s own voice changed to fit characters in books or messages being read. (e.g. “I hear my voice, and then my voice changes to suit the character. If it's Harry Potter, I hear Stephen Fry.”)

## Inner Reading Voices

Several P-IRVs suggested that memories of real voices (of relatives, friends, teachers, or actors) were being incorporated into their IRVs (e.g. “i remember when i was little though i used to always read to myself in a voice i didn't know and i realized it was from of those of cds that read for us that we followed along with, i would guess that the voice you speak of is really a collection of vocies you've heard...”).

### *Auditory quality of IRVs*

An overwhelming majority of P-IRVs (95.5%) indicated that IRVs were audible. Sometimes specific auditory qualities were described, including loudness (e.g. “...sometimes when I'm reading I hear voices shouting back the words I'm reading at me”), depth (e.g. “...a deep monotone voice, really doesn't sound like my voice at all...”), emotional tone (e.g. “...a real low whisper of a voice, kind of sexy...”), gender (e.g. “...I hear a sort of young, quiet, male voice though I am female. ...”), rate (e.g. “...like fast talking with what I'm reading...”), pitch, or accent (e.g. “...My mind creates a different pitch or accent based on the character's description”). Some posters indicated more than one of these qualities. IRVs of some posters were coded as having an audible quality because the posters wondered if deaf people could have such a voice (e.g. “When I read or think to myself, I hear an internal voice that talks to me. Do deaf people hear an internal voice? I think that if you had hearing at one time, but then lost it, you might still hear your internal voice.”) Many posts also identified voices as their own, as specific people (e.g. “...if my boyfriend leaves me a note I hear it in his voice reading it to me not my voice...”), as multiple people (e.g. “I hear many peoples' voices in my head...”) or contained contextual information that suggested an audible quality (e.g. “I essentially hear my own internal voice, which is quite different from the voice other people hear, as can be shown by recording yourself and playing it back...”).

## Inner Reading Voices

### *Controllability of IRVs and associated emotions*

Of the 14 P-IRVs who were coded as being unable to control their IRVs, three expressed annoyance, indicating that their IRVs were distracting (e.g. "...I get very distracted from what I'm reading because I can't get the voice to go away-- it annoys me so. This has really become a problem recently because It's almost as if I've developed a phobia for reading, because I can't stand to hear that clear voice in my head when I read!...")

Two P-IRVs expressed fear. One said voices were present even when not reading ("I get this really weird thing where sometimes when I'm reading I hear voices shouting back the words I'm reading at me, it's really strange. At other times they just shout at me, usually when I'm lying quietly in bed. Its really scary, and the tone in which they shout at me is horrible.") The other described a disturbing subvocalization experience ("...the notion that I can sense the movement of the lips and vocal cords too frightens me. Basically when I read I hear a voice and also the way certain words are pronounced by that voice.").

Two others who appeared unable to control their IRVs expressed ambivalence. One of these posters, in a lengthy and somewhat incoherent post, mentioned an IRV and multiple other voices, and described a time of struggle, possibly mental illness, and subsequent recovery. The other poster was concerned about a slow reading rate.

The remaining seven P-IRVs who appeared unable to control their IRVs expressed curiosity, amusement or interest, or did not express any particular emotion, although one did describe an IRV that was continuous with audible, intrusive, unwanted thoughts.

Seven P-IRVs indicated that IRVs could be consciously selected (e.g. "I try to pick a character in a book that sorta fits to me and than it's my voice I read into it, the other characters have their own.") or modified (e.g. "Like, when I read a novel with a protagonist who has an



## Inner Reading Voices

accent, I still never make that character have an accent, because I make the character sound like me...”). These posters did not express any particular emotion about their IRVs.

In cases where controllability could not be determined, almost all P-IRVs either did not express a particular emotion, or expressed interest or curiosity. The one exception expressed ambivalence (“Well, yeah, but I don't really put any meaning behind it. I think that it's normal... You use different voices. Or else you'd just be reading in your own voice. I've never thought about that. You're making me feel creeped out, now. :I”)

### *Similarity to thinking*

Several P-IRVs indicated that IRVs were similar to or continuous with thoughts, which also appeared to be audible. IRVs were coded as being similar to thinking if posters mentioned that IRVs were like voices heard while thinking or having discussions with oneself, or like their inner voices, or like hearing their own voices in their head (if this happened at other times as well as when reading). Many of these posters assumed that having this kind of internal voice was a common phenomenon (e.g. “Most people, whether they want to say it or not, actually do hear a voice in their head. Sometimes it reads what they are typing, or it talks about things for instance "Hell no this candy shouldn't be 1.50 Nuh uh" it's quite normal to have a voice that speaks out your thoughts and some people actually may talk to their own thoughts.”).

One person indicated that IRVs were dissimilar to thinking, although thoughts were still reported to have an audible quality (“Like, when I'm reading, the voice I hear in my mind is the voice of whoever the narrator is... But if I'm just thinking to myself, I think in my own voice. Though sometimes that voice in my head that is my own voice doesn't sound like my own, you know what I mean? Like maybe it'll be deeper or more high pitched or something.”).

None of the 17 P-NIRVs mentioned having audible thoughts.

## Inner Reading Voices

### *Assumed presence of reading voice in others*

Almost a third of P-IRVs assumed that IRVs were a common phenomenon (e.g. “We all hear our own voices in our heads at times - even those of others we know - especially while reading.”). Only 3 P-IRVs assumed that others did not have IRVs (e.g. “haha, i thought i was the only one!”)

Only one of the 17 P-NIRVs assumed that others had IRVs (“I don't hear a voice in my head, no. Apparently most people do, but I don't.”). Six of the 17 P-NIRVs assumed that IRVs were *not* commonly present in others, with five suggesting that IRVs were indicative of a problem. In response to a question from a P-IRV about whether others had IRVs, one P-NIRV stated: “Noooo. You should get that checked out”, and another stated: “NO, I'M NOT A FREAK.[sic]”)

### *Normality of IRVs*

Thirty two P-IRVs (24.2%) suggested that having an IRV was *not* indicative of a problem such as mental illness. (Posts were only coded for the presence or absence of this suggestion, so the remaining posts did not necessarily indicate that IRVs were problematic.)

Most of these posters suggested that IRVs were not problematic because they are a common phenomenon. Some distinguished between IRVs and voices heard by individuals with mental illness. The kinds of distinctions made included hearing one's own voice rather than someone else's (e.g. “No, you're not mad. Unless the voice you hear isn't your own, that would be a little worrying.”), hearing a voice that was not too realistic (e.g. “[In schizophrenia, it's] sort of like when you're reading a book and you can hear a voice in your mind but it sounds more realistic.”), hearing a voice that was not too loud (e.g. “A schizophrenics voices are actually louder then when your reading a book.”), hearing a voice that is not bizarre or out of control (e.g.

## Inner Reading Voices

“It's really only if this voice is out of control, ...and saying bizarre things that you might want to consider getting help.), hearing a voice inside rather than outside one's head (e.g. “The "inside" your head type is something everyone experiences.”), not hearing commands or conversations (e.g. “When a voice in your head is telling you to do something, or are talking to you, rather than just being thoughts, then you should see a psychologist.”), hearing a voice only while reading (e.g. What voice do you hear in your head? Im not talking about being schizophrenic or anything... I mean when youre reading, like you are right now...?”).

Despite these opinions about why IRVs are different from voices heard by individuals with mental illness, posters' IRVs were quite heterogeneous, with several posters reporting loud IRVs, and IRVs in other people's voices. A few posters reported having IRVs that were bizarre and out of control, that carried on conversations, and that were heard when not reading.

### **Discussion**

These spontaneous self-reports indicate that audible IRVs are regularly present in many individuals, although this study did not seek to determine what proportion of the population experiences them.

Different types of inner speech are not clearly defined in the existing literature. While differences between expanded inner speech (i.e. thoughts with sentential structure) and condensed inner speech (i.e. thoughts without sentential structure) are discussed (e.g. Jones & Fernyhough, 2007; McCarthy-Jones & Fernyhough, 2011; Perrone-Bertolotti et al, 2014), a distinction is usually not drawn between thoughts that are in sentence form *but not heard*, and thoughts that are in sentence form *and heard*. Similarly, in studies of auditory verbal imagery (Hubbard, 2010; Linden et al, 2011; Shergill et al, 2001), experimental subjects are instructed to imagine speech, but it is usually not clear whether they actually hear the imagined speech. The

## Inner Reading Voices

present study indicates that individuals may differ in inner speech, and specifically in IRVs, such that some people hear voices while reading while others do not. Another way to conceptualize these individual differences might be in terms of capacity to generate unusually vivid auditory imagery, although this conception may be problematic if imagery is expected to lack the concrete reality of perception (Stephane et al, 2003), since IRVs appear to have the audible properties of overt speech. Although a distinction, if any, between vivid auditory imagery and auditory perception would certainly be important, no published studies have clearly made this distinction. Phenomenological similarity between auditory imagery and auditory perception has generally been studied either by examining auditory qualities such as loudness, pitch, accent and gender, or by comparing brain areas activated during auditory imagery and perception (for a review of research, see Hubbard, 2013).

That IRVs have not been studied previously is curious, as is the lack of attention paid to the distinction between auditory and non-auditory verbal inner speech. These gaps in the literature may be related to the finding that many who hear IRVs assume that others do as well. Researchers themselves may assume that other people's normal inner experiences are like their own. Reisberg, Pearson & Kosslyn (2003) have found that researchers' own theoretical views tend to be correlated with their subjective imagery experiences. Experiences such as IRVs are less likely to come to light in experimental, survey, or even interview studies, where behavior or information are elicited by the researcher, than in studies of spontaneous self-reports.

This study has some limitations. Because spontaneous self-reports were analyzed, information about IRV experiences was limited. It must be noted that it was not possible to determine whether P-IRVs were engaging in "inner speaking" or "inner hearing"; Hurlburt, Heavey & Kelsey (2013), who described these two forms of inner experience, acknowledge that

## Inner Reading Voices

most individuals cannot distinguish between the two without training. Sample demographic information, such as gender, age and mental health status, is not available as most posters did not offer that information. The results reported here may not be representative of the experiences of all IRV-hearers, since only users of the *Yahoo! Answers* website were sampled. Additionally, as in any self-report study, posters could have lied or misrepresented their experiences. However, social desirability is unlikely to have influenced the self-reports, as social desirability does not correlate with vividness ratings of auditory imagery, unlike with ratings of visual imagery (Hubbard, 2010). While a few affirmative answers to questions from IRV-hearers could have been due to a desire to conform, the descriptive quality of most answers suggests that this is unlikely. Furthermore, some answers to such questions did dissent, and the questions themselves could not have been due to a conformity effect.

### *Clinical Implications*

Some posters reported that their IRVs were continuous with, or like, their thoughts, which also appeared to be audible. (Given the nature of the study, it is not possible to determine whether those who did not *report* audible thoughts could nevertheless hear their thoughts.) This continuity is particularly interesting in light of the fact that these IRVs/auditory verbal thoughts were perceived as being out of control in a few cases. One poster said, “Like when I’m trying to read I hear a voice reading it out loud in my head or when I just think I can hear what I’m thinking about. I also can have conversations with this voice... Every so often this voice also just pops up with horrible things...” This poster went on to describe the voice as intrusive, unwanted and uncontrollable, but did not mention being distressed. However, another poster (described earlier) with uncontrollable IRVs/auditory verbal thoughts did appear distressed. As distress about voice-hearing experiences seems to be a defining factor for determining need for care (de

## Inner Reading Voices

Leede-Smith & Barkus, 2013), this raises the possibility that IRVs/auditory verbal thoughts may, at least in rare instances, be continuous with pathological AVHs. The relationship between IRVs, auditory verbal thoughts and AVHs is deserving of further study.

IRVs may be a useful model for AVHs because they occur routinely and spontaneously in some individuals. Like AVHs, IRVs appear to be perception-like experiences that occur without an auditory stimulus. Like AVHs (Daalman et al, 2011; Laroi, 2012; Stephane et al, 2003), IRVs were sometimes identified as other people's voices. In these cases, the posters did not seem delusional; for example, when hearing actors' voices, posters gave no indication of believing that the actors were actually communicating with them. The fact that IRVs are sometimes voices other than the reader's own provides support for inner speech theories of AVHs (reviewed in McCarthy, 2012), as some objections to such theories are based on the assumption that inner speech cannot occur in other people's voices (e.g. Wu, 2012). Further studies of IRV phenomenology are needed to determine how IRVs differ from AVHs, which are very phenomenologically diverse (McCarthy-Jones et al, 2014; McCarthy-Jones, 2012).

If the current results are confirmed through future studies, IRVs could provide evidence for individual variation in imagery vividness and support inner speech accounts of AVHs. They may be a useful model for studying AVHs in the non-clinical population, and need further investigation.

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## Inner Reading Voices

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## Inner Reading Voices

Table 1: IRV characteristics in posters with IRVs (total N=132)

<b>CHARACTERISTIC</b>									
<b>N (%)</b>									
<b>Frequency of IRVs</b>	Regularly	Sometimes	UTD*						
	91 (68.9)	13 (9.8)	28 (21.2)						
<b>Number of IRVs</b>	One	More than one	UTD*						
	64 (48.5)	49 (37.1)	19 (14.4)						
<b>Identity of IRV</b>	Own voice	Book character	Celebrity	Sender or writer of a message	Friend	Relative	Other	>1 identity mentioned	UTD*
	39 (29.5)	8 (6.1)	5 (3.8)	4 (3.0)	3 (2.3)	1 (0.8)	4 (3.0)	28 (21.2)	40 (30.3)
<b>Assumed presence of IRVs in others</b>	Presence assumed	Absence assumed	UTD*						
	42 (31.8)	3 (2.3)	87 (65.9)						

Inner Reading Voices

<b>Similarity to thinking</b>	Similar	Dissimilar	UTD*						
	22 (16.7)	1 (0.8)	109 (82.6)						
<b>Controllability of IRV</b>	Not Controllable		UTD*						
	7 (5.3)	14 (10.6)	111 (84.1)						
<b>Auditory quality of IRV</b>	Has auditory quality	UTD*							
	126 (95.5)	6 (4.5)							
<b>IRV auditory qualities noted</b>	Gender	Emotional tone	Loudness	Accent	Absence in deaf individuals	Depth	Pitch	Rate	Contextual reference
	15 (11.4)	8 (6.1)	7 (5.3)	5 (3.8)	5 (3.8)	4 (3.0)	4 (3.0)	1 (0.8)	118 (89.5)

\* UTD= Unable to determine

