

# Anendophasia

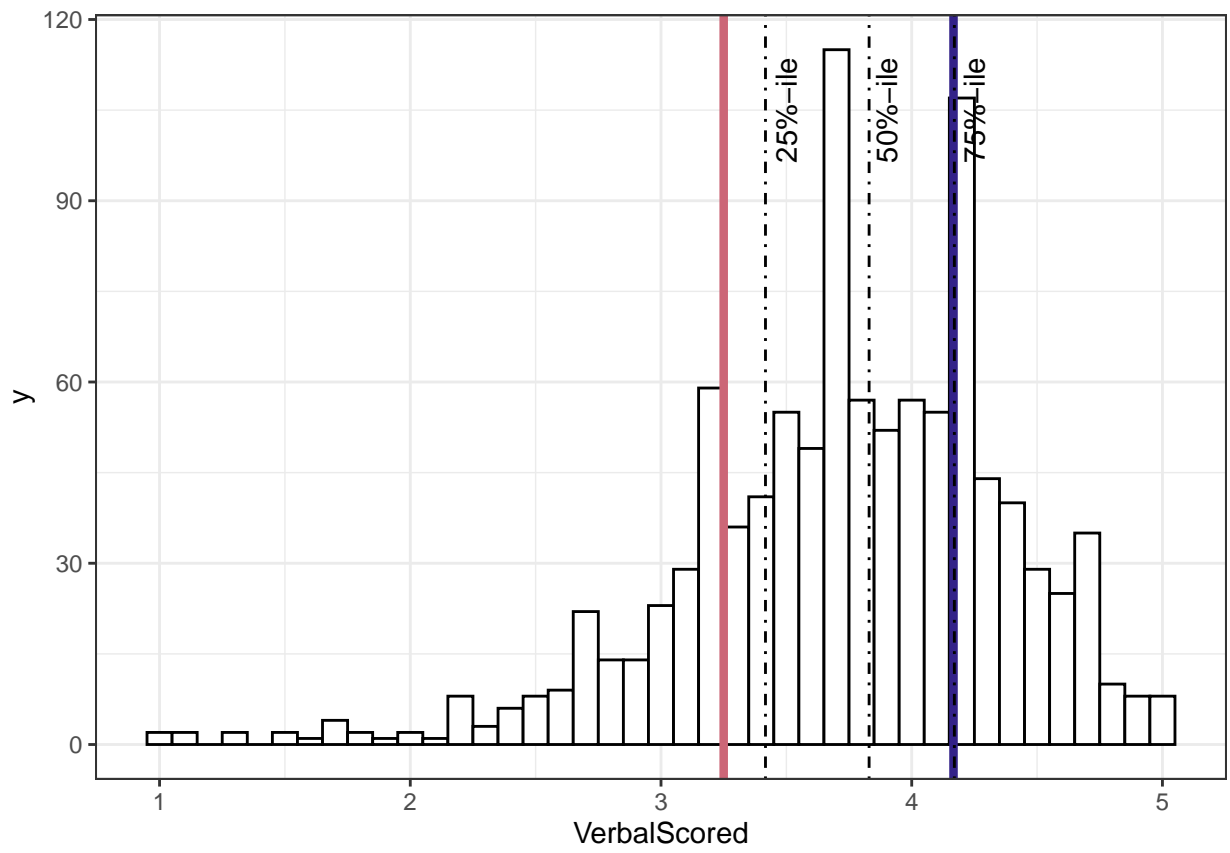
## Supplemental materials

2024-02-19

### Internal Verbalizations factor from the Internal Representations Questionnaire (Roebuck & Lupyan, 2020) with factor loadings

Item	Verbal.Factor
I think about problems in my mind in the form of a conversation with myself	0.776
If I am walking somewhere by myself, I often have a silent conversation with myself	0.719
If I am walking somewhere by myself, I frequently think of conversations that I've recently had	0.699
My inner speech helps my imagination	0.653
I tend to think things through verbally when I am relaxing	0.650
When thinking about a social problem, I often talk it through in my head	0.595
I like to give myself some down time to talk through thoughts in my mind	0.583
I hear words in my "mind's ear" when I think	0.559
I rarely vocalize thoughts in my mind	0.493
I often talk to myself internally while watching TV	0.486
My memories often involve conversations I've had	0.486
When I read, I tend to hear a voice in my "mind's ear"	0.467

Distribution of Verbal Scores on the IRQ with cut-offs (full sample N = 1037)



## Ordinal custom survey questions

Question	Options	Code
How often do you experience trouble focusing on a face-to-face conversation you are having because of a conflicting conversation happening in your mind at the same time?	Never (1) Rarely (2) Sometimes (3) Often (4) Always (5)	ConversationFocus
How often do you have songs stuck in your head?	Multiple times a day (5) A few times a week (4) A few times a month (3) A few times a year (2) Never (1)	EarWorms
If you had to recall a short conversation about a specific topic that you had yesterday with a friend, how easily can you recall the exact words your friend said?	I can easily recall it. If I wrote it down and matched to a recording of the conversation, there'd be an almost perfect match (5) I remember the topic and remember much of what was said. If I matched it to a recording of the conversation, a lot would match up. (4) I remember the topic, but remember only a few of the specific words/sentences. (3) I remember the topic, but can't remember any of the specifics. (2) Other (1)	RecallFriendConvo
If you had to recall a short conversation about a specific topic that you had yesterday with a friend, how easily can you recall the exact words you said?	I can easily recall it. If I wrote it down and matched to a recording of the conversation, there'd be an almost perfect match (5) I remember the topic and remember much of what was said. If I matched it to a recording of the conversation, a lot would match up. (4) I remember the topic, but remember only a few of the specific words/sentences. (3) I remember the topic, but can't remember any of the specifics. (2) Other (1)	RecallSelfConvo
When you recall a conversation like the one you were thinking about for the last 2 questions, do you hear the words in your mind?	It's just like I'm hearing the conversation again. (4) I hear a condensed version (e.g. only some words). (3) I hear something but I can't describe it. (2) I can't hear it, but I can still recall it. Please briefly say something about how you are recalling it. (1)	HearConversation
Can you "sing along" to music without singing out loud?	Yes - definitely (4) Yes - somewhat (3) No - but I can imagine how others can do it (2) No - I can't imagine how anyone could do this (1)	SingAlongAbility
If you can "sing along" to music without singing out loud, to what extent does this feel like regular thinking?	Not at all (1) Mostly different from regular thinking (2) Neutral (3) Mostly similar to regular thinking (4) Exactly like regular thinking (5) I can't sing along without singing out loud (6)	SingAlongThinking

(continued)

Question	Options	Code
If you imagine someone else speaking, how do you experience their voice?	I hear what they say in their voice. (4) I hear what they say but in my own voice. (3) I hear the words but I can't tell whose voice it is. (2) I don't "hear" anything, I imagine it by... (please specify) (1)	OtherVoiceQuality
To what extent do you agree with this statement: 'It is generally difficult and takes effort to express in words how I think and feel'.	Strongly agree (1) Agree (2) Neither agree nor disagree (3) Disagree (4) Strongly disagree (5)	ExpressInnerStates
Do you ever revise past conversations in your mind (i.e. think of a better comeback, a way of phrasing what you wanted to say)?	Never (1) Rarely (2) Sometimes (3) Often (4) Very often (5)	SimulatePastConvo
Do you ever rehearse a conversation before you have it in real life where you simulate what you will say and how the other person will respond?	Never (1) Rarely (2) Sometimes (3) Often (4) Very often (5)	SimulateFutureConvo
To what extent do you agree with this statement: "I do not know why I do some of the things that I do."	Strongly disagree (1) Disagree (2) Neither agree nor disagree (3) Agree (4) Strongly agree (5)	ImpulsivenessLackOfInsight
To what extent do you agree with this statement: "I am a firm believer in thinking things through."	Strongly disagree (1) Disagree (2) Neither agree nor disagree (3) Agree (4) Strongly agree (5)	ImpulsivenessThinkThingsThrough
To what extent do you agree with this statement: "I like to act on a whim."	Strongly disagree (1) Disagree (2) Neither agree nor disagree (3) Agree (4) Strongly agree (5)	ImpulsivenessWhim
For each scale, please indicate what percent of people you know you think have each of these three experiences: - Experience their thoughts in the form of a conversation with themselves - Can see vivid images in their mind's eye - Hear words in their mind's ear when they silently read	No one (0%) to Everyone (100%)	OthersExperiencesConversation, OthersExperiencesMindsEye, OthersExperiencesMindsEar

## Nominal custom survey questions

Question	Options	Code
If you have to ask a question in front of an audience, which of these best describes what you typically do?	I rehearse in my mind the exact phrasing of what I am going to ask (5) I rehearse in my mind some of what I am going to ask before asking it (4) I think of a question I want to ask and just ask it (3) Other (2) I'm never in a position to ask questions in front of an audience (1)	RehearseQuestion
Many people feel that a lot of their thinking, planning, and decision-making takes place in the form of a conversation with themselves. They describe that when they think, they hear words in their mind. Other people do not have this experience and instead say that they "think in ideas". Is your experience more like the first or the second?	More like a conversation (2) More like "thinking in ideas". Can you elaborate or give an example of what this means to you? (1)	ThinkingInIdeas
Do you think it is stressful and annoying to have an inner monologue?	Yes, very (3) Maybe a little (2) No, I don't think so (1)	StressfulInnerSpeech
In books and movies, we often see characters talking to themselves at length. How much do you think this reflects real life?	It's just for the viewer/reader's benefit (1) It might be like real life but mostly for the viewer's/reader's benefit (2) It's exactly like real life (3)	InnerSpeechFiction
Have you been diagnosed with dyslexia or another reading disorder?	Yes, officially diagnosed (1) Yes, self-diagnosed (2) No, never (3)	Dyslexia
Imagine you are lying in bed with your eyes closed trying to fall asleep. Is your inner experience then...	Primarily verbal (you "hear" or "speak" words and sentences in your mind) (1) Primarily visual (you "see" situations, objects, people etc. in your mind) (2) Primarily about sensory awareness (what you are hearing, smelling, and feeling in the moment) (3) Primarily emotional (4) An even mix of verbal, visual, sensory, and emotional (5) My inner experience in that situation does not have a specific "format" (6)	DriftOffQuality

# Correlations between custom questions and Varieties of Inner Speech Questionnaire (VISQ)

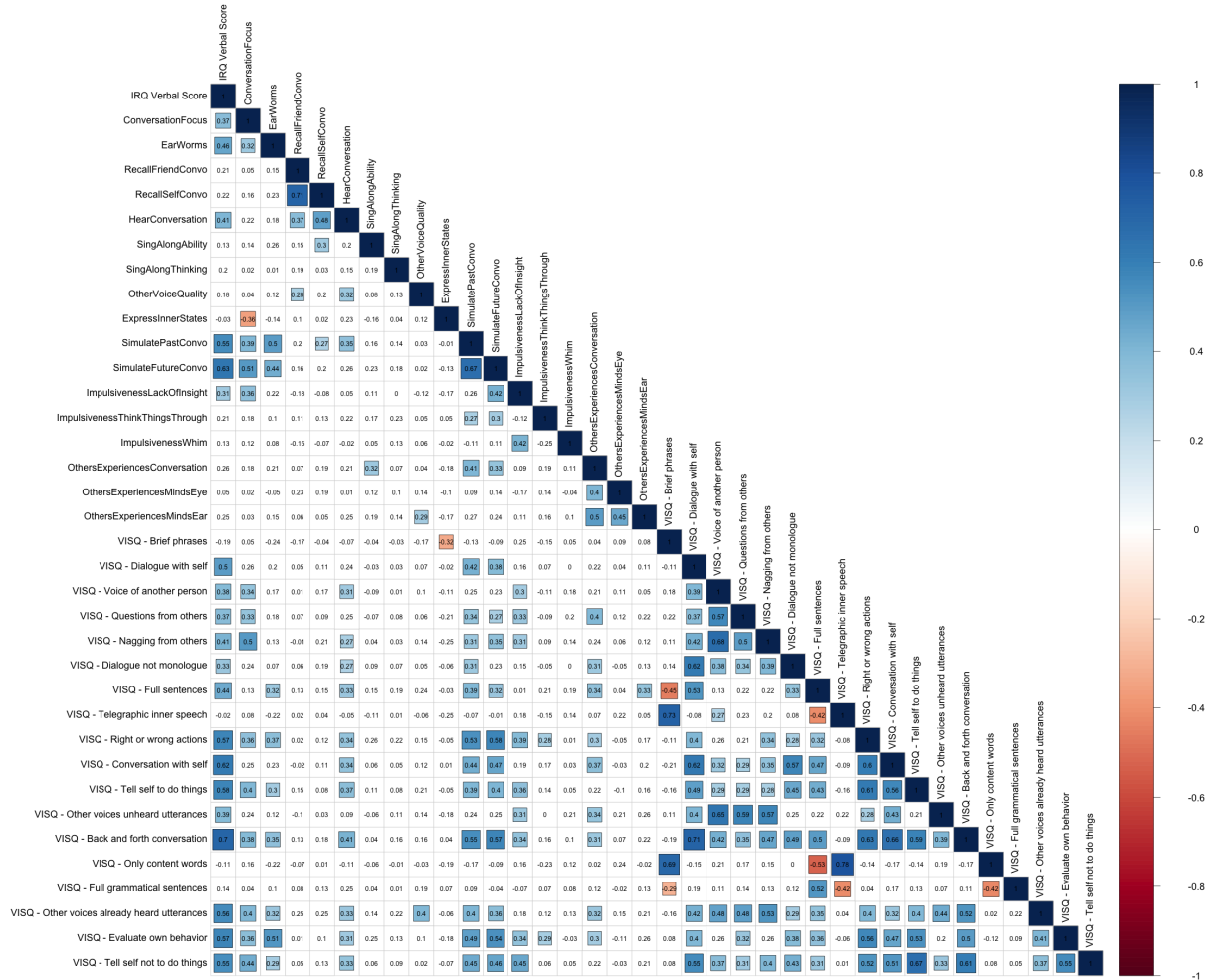
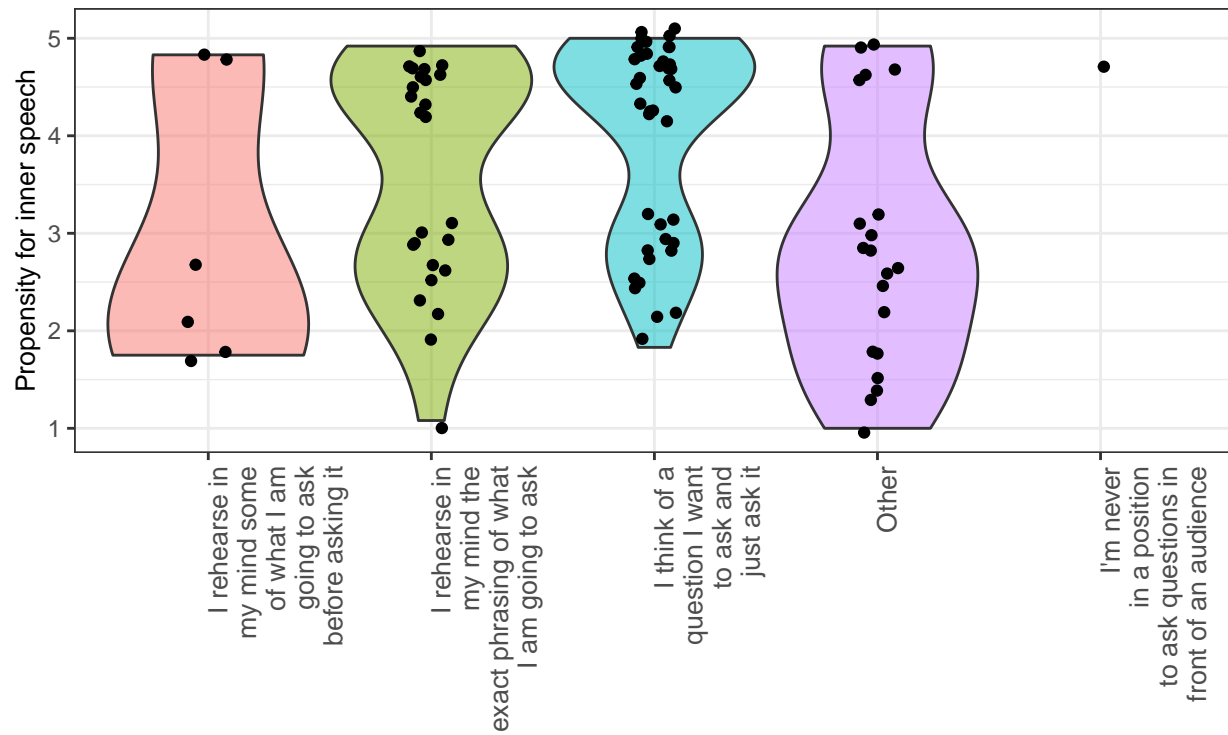


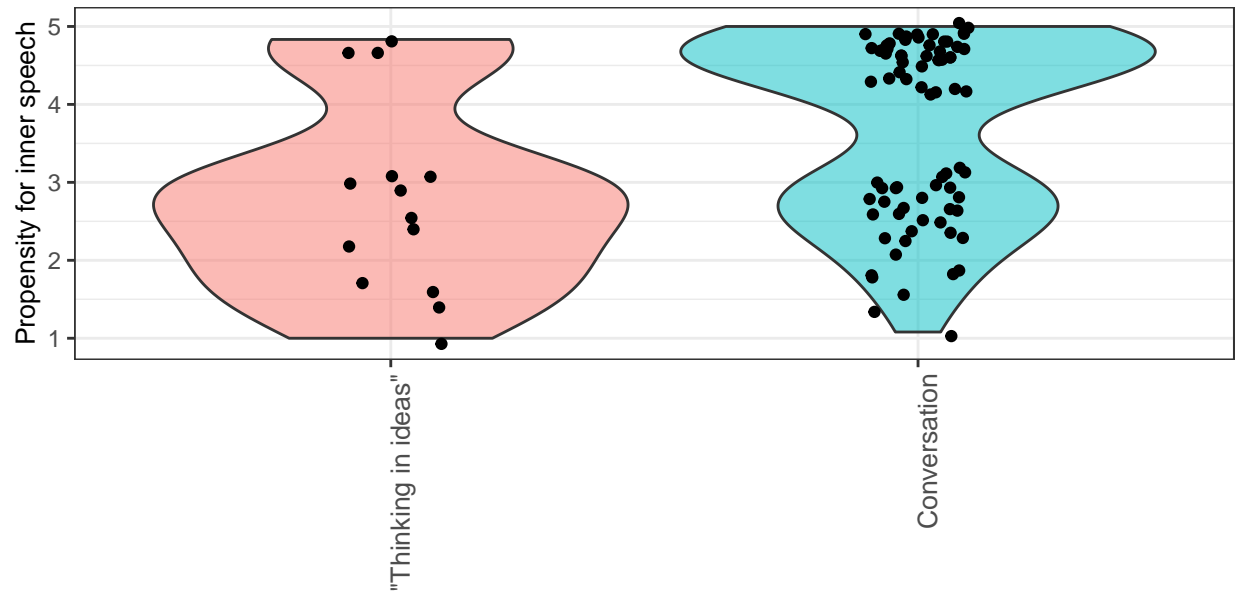
Figure 1: Correlations between survey measures in the total sample of participants. Colored squares represent significant correlations at  $p < .01$  which with the given sample size ( $N = 92$ ) is equivalent to a correlation coefficient of at least  $r = \pm .27$ .

## Nominal questions and their relations with Verbal Score

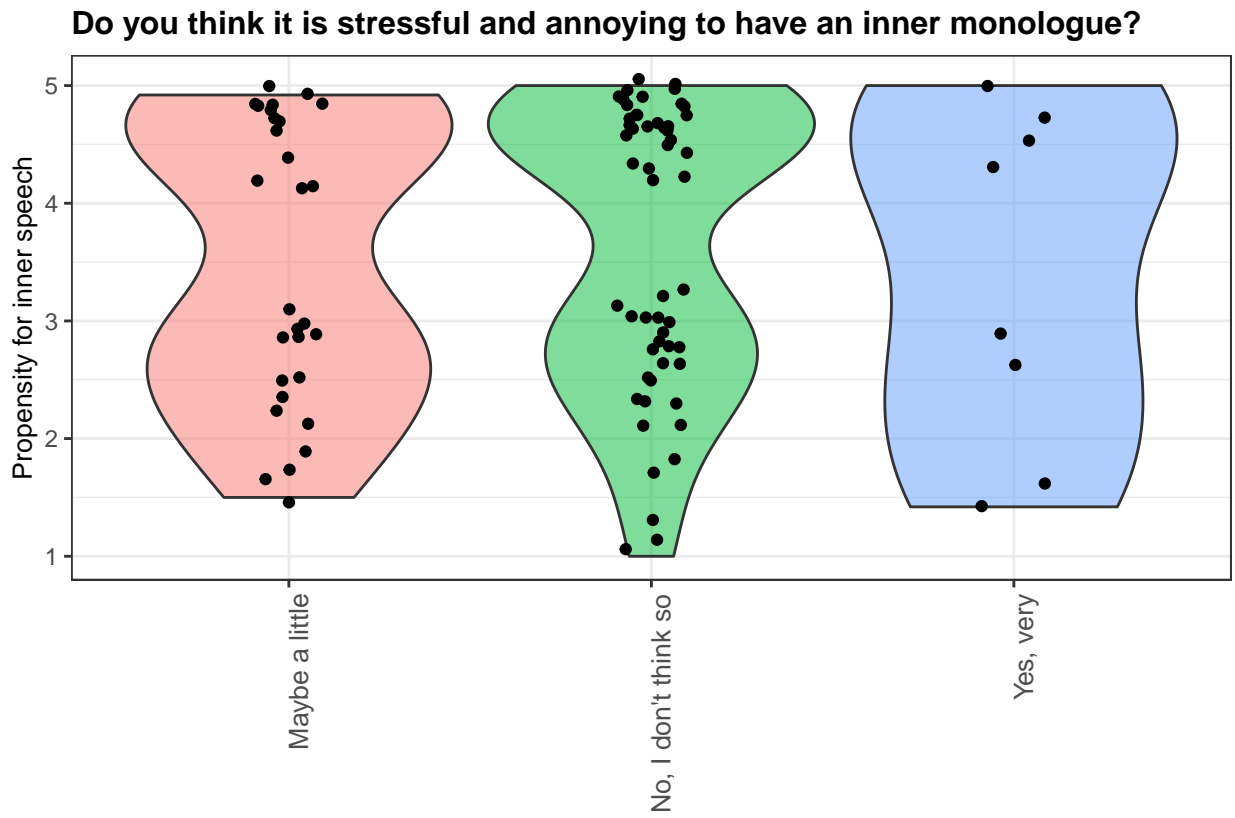
**If you have to ask a question in front of an audience, which of these best describes what you typically do?**



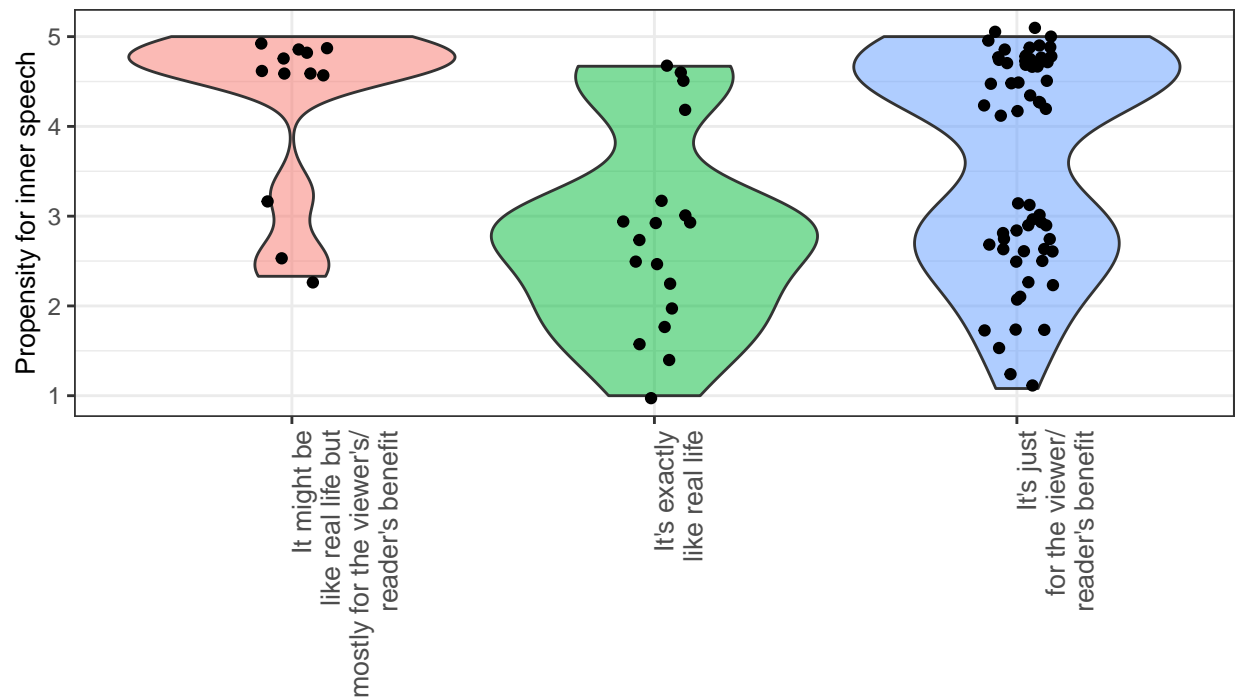
Many people feel that a lot of their thinking, planning, and decision-making takes place in the form of a conversation with themselves. They describe that when they think, they hear words in their mind. Other people do not have this experience and instead say that they "think in ideas". Is your experience more like the first or the second?



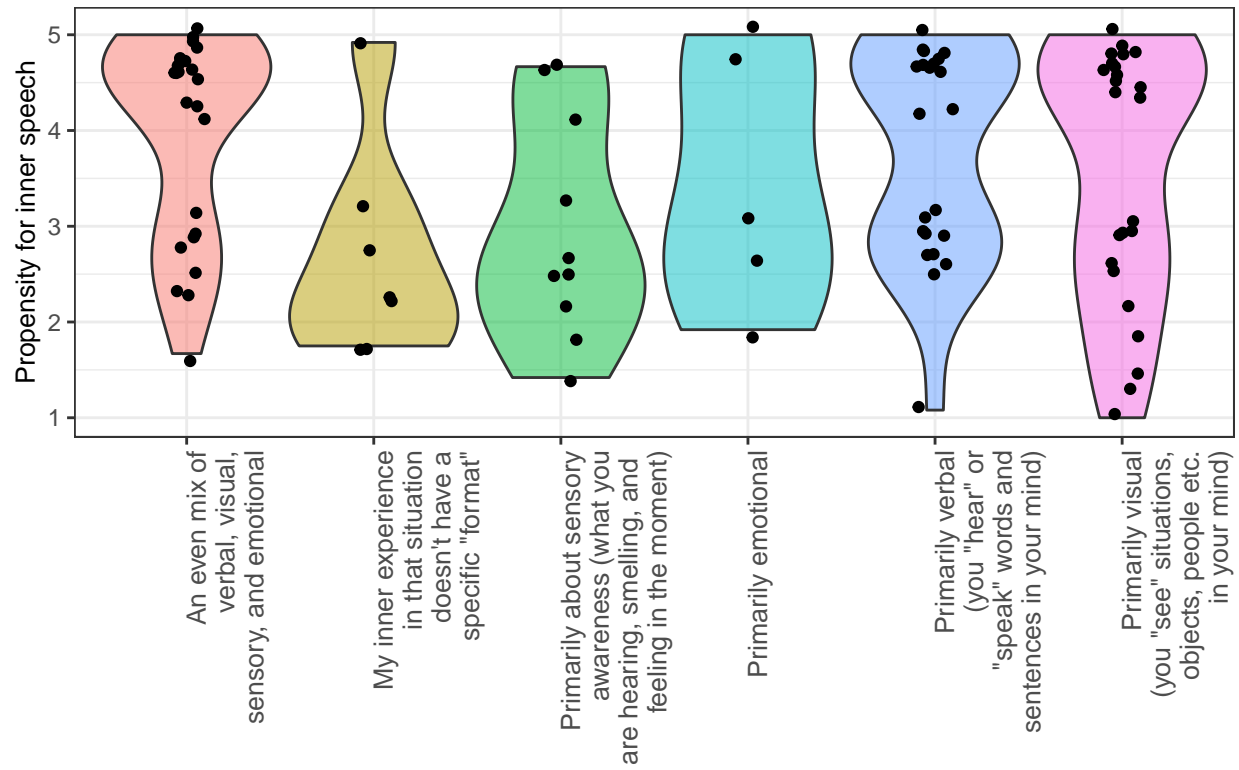




In books and movies, we often see characters talking to themselves at length.  
How much do you think this reflects real life?



## What is your experience like when you are trying to fall asleep?



## Rhyme judgment items

### Target words characteristics (frequency and name agreement)

Table 4: Materials for the rhyme judgment experiment including name agreement (0 to 1) from a separate validation experiment and target word frequency (SUBTLEX log-transformed counts).

Target word	Name agreement	Target word frequency
bag	0.95	3.6810
bear	0.95	3.4667
bed	0.95	3.9797
beer	0.75	3.5856
bell	0.90	3.3025
bone	0.95	3.1239
box	0.95	3.6607
brain	0.95	3.5943
bread	0.90	3.1602
cab	0.05	3.2617
cat	0.90	3.5294
chain	0.95	3.0346
chair	0.95	3.4000
claw	0.55	2.3502
clock	0.95	3.4758
cone	0.70	2.1761
crab	0.95	2.5478
crane	0.70	3.2343
dart	0.90	1.9956
deer	0.65	2.6484
door	0.95	4.1731
drawer	0.80	2.8222
drum	1.00	2.6365
egg	0.95	3.1235
eye	0.95	3.7560
fan	0.75	3.2536
flag	0.90	2.9509
fly	0.95	3.6371
fox	0.85	3.0426
hair	0.90	3.8939
hat	1.00	3.5151
heart	0.90	4.0953
jar	0.95	2.6284
key	0.95	3.6465
king	0.80	3.8191
leg	0.85	3.4598
man	0.80	4.9737
moon	0.95	3.4064
nail	0.95	2.9786
nose	1.00	3.5512
pear	0.95	1.8388
plane	0.35	3.6878
pope	0.45	2.7380
ring	0.90	3.6750
rope	1.00	3.0641
rose	0.95	3.4322
saw	1.00	4.3123
screw	1.00	3.2817
seal	0.75	2.8768
shoe	0.85	3.1906
snail	0.95	1.9590
soap	0.80	2.8899
sock	0.90	2.6618
socks	0.90	2.9699
spoon	1.00	2.5899

Table 4: Materials for the rhyme judgment experiment including name agreement (0 to 1) from a separate validation experiment and target word frequency (SUBTLEX log-transformed counts). (*continued*)

Target word	Name agreement	Target word frequency
square	0.85	3.2098
star	0.95	3.6180
thumb	0.90	2.7810
tie	0.70	3.3555
train	0.95	3.6857
tree	0.85	3.5206
well	0.95	5.1833
whale	0.95	2.7597
wheel	0.75	3.1402

### Frequency of target words

Using linear models, we tested whether there were any differences in mean frequency (SUBTLEX log-transformed counts) between the three rhyming conditions (including random intercepts for stimulus pair) and whether the three conditions differed in the absolute difference between the modal name of the first and second picture. Target word frequency did not differ between conditions (both  $p > .391$ ) and neither did absolute difference in frequency between the two target words in a given stimulus pair (both  $p > .155$ ).