

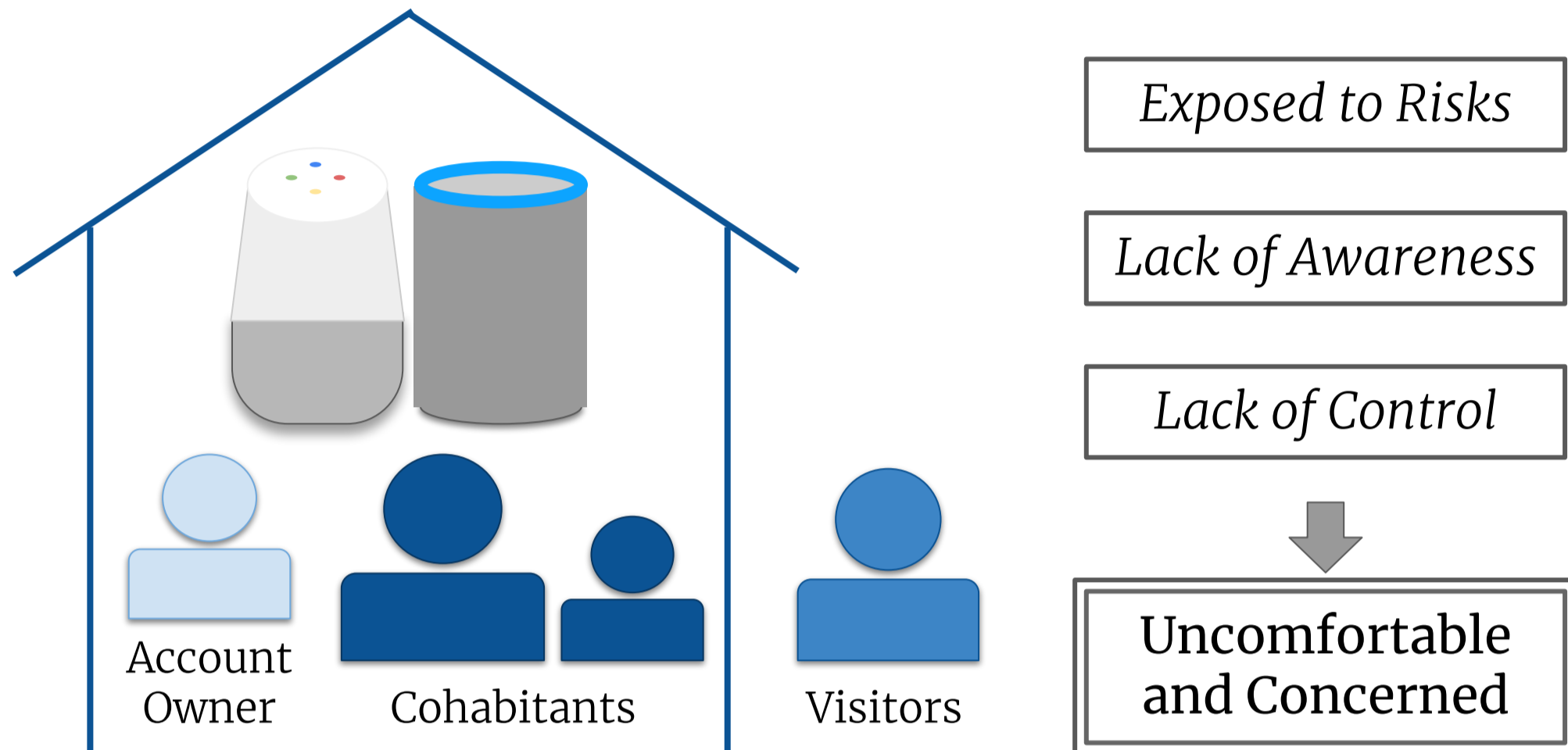


A Narrative Review of Concerns and Problematic Interactions

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Motivation

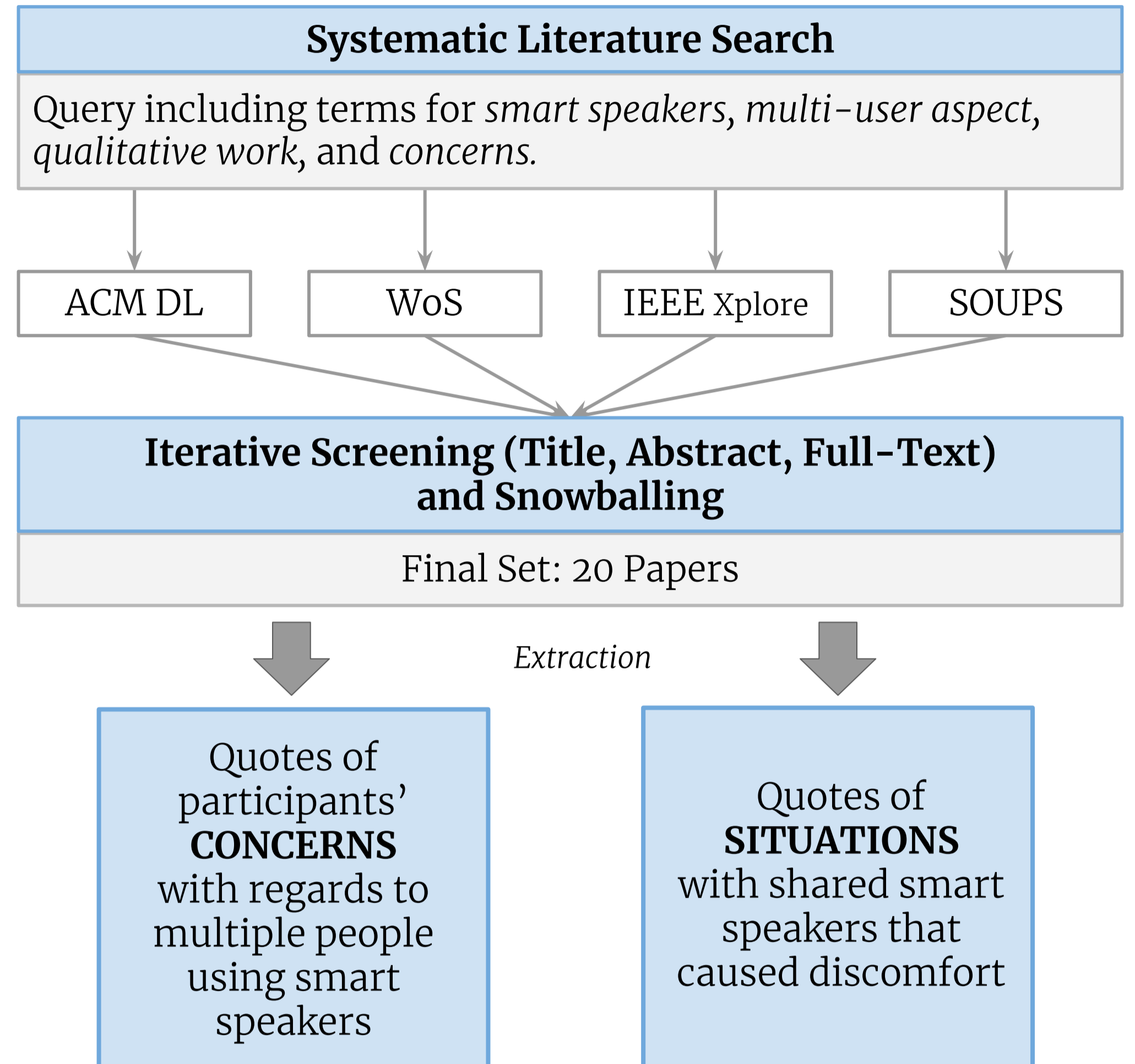
Smart Speakers in homes are rarely used only by the account owner. Other users such as **cohabitants** and **visitors** may be in the same space as the device, exposing them to the risks of smart speakers. Smart speakers differ from other smart home device due to using voice recordings and audible interactions.



RQ1: What concerns do users have about sharing smart speakers?

RQ2: Which awkward situations have users experienced with multi-user smart speakers?

Methodology



Results

	Author/Year	Study	Owner	Family	Cohabitant	Bystander	Non-User	Interview	Diary Study	Focus Group	Survey
Smart Speakers Only	Meng et al. [2021]	[27]	•	•	•	•	•	•			
	Huang et al. [2020]	[20]	•	•	•			•			
	Porcheron et al. [2018]	[30]†	•	•					•		
	Garg [2020]	[14]	•	•				•	•		
	Beneteau et al. [2020]	[6]	•	•				•	•		
	Ponticello et al. [2021]	[29]	•					•			
	Chalhoub and Flechais [2020]	[7]	•					•			
	Lau et al. [2018]	[23]	•					•	•	•	
	Davitt and Brown [2022]	[9]									•
SS + Voice	Luria et al. [2020]	[25]††	•	•				•			
	Garg and Sengupt [2019]	[16]	•	•				•	•		
	Storer et al. [2020]	[33]	•	•				•			
Smart Homes	Shank and Gott [2020]	[32]	•	•	•	•	•				•
	Garg and Moreno [2019]	[15]	•	•	•	•		•	•		
	Geeng and Roesner [2019]	[17]	•	•	•			•	•		
	Tabassum et al. [2020]	[35]	•	•	•			•			•
	Zeng et al. [2017]	[40]	•	•	•			•			
	Wright and Shank [2022]	[37]	•					•			
	Yao et al. [2019]	[39]				•	•				•
Ahmad et al. [2020]	[2]					•	•				

- Concerns**
 - Concerns about 'other people'
 - Mainly by owners, but ownership not always clear
 - Concerns for 'other people'
 - Owners protecting other users' data
 - Concerns about the Device
 - Owners: Malfunction and unwanted data sharing
 - Visitors: Device nature and lack of awareness
- Scenarios**
 - Intentional Misuse including Pranks, Privacy Invasion, and Unauthorised Purchases
 - Unexpected Smart Speaker Behaviour
 - Tensions when Adopting and Sharing

Examples

- Concerned about device faults:** "I do not feel the [purchasing feature is] secure enough because my younger brother has a similar voice. Sometimes when we talk [to] the speaker, it recognizes him as me." [20]
- Leaking private information:** "I had purchased several gifts for my family on amazon, and not knowing that my echo would blurt out all of the items, I asked about the status of my order, expecting a date to be played back. Instead, the device played out what was in my order, followed by a prompt if I wanted to forego listing out everything in future. Unfortunately, my family was within earshot and heard everything." [32]
- Tension at adoption:** "There was nothing like 'Hey, there is going to be a potential spy in the house'. There was no foreknowledge on my part. I remember being remotely annoyed by that" [27]
- Unprompted Activation:** "If we are talking just amongst ourselves and he says something vaguely like 'okay Google' which is the activation thing, it will start listening and it is kind of weird." [39]