

Online Information Disorder & Children

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Abstract

The rise of digital platforms for accessing online content—from popular search engines to social media sites—has contributed to the (un)intentional propagation of misleading information. This phenomenon, known as *Information Disorder*, affects individuals and society. Extensive research has been conducted to study and address Information Disorder as it pertains to the general population. Yet, little is known about how children, who have specific needs and behaviours when interacting with digital content, deal with misleading information and how the algorithms, that underlay the information access tools they use, mitigate or exacerbate the issue. Through a systematic literature review, we present research efforts that address or discuss the impact of Information Disorder on children and their overall information-seeking experience. We analyse the literature from various perspectives, including children's behaviour across platforms and the solutions developed to mitigate misleading information. Inspired by the knowledge distilled and gaps identified in our review, we discuss research directions that tackle both technological and human-centred challenges children face when dealing with misleading information, seeking to establish a foundation to mitigate the effects of Information Disorder among children.

Keywords

Children, Information Disorder, Misinformation, Disinformation, Information Access

1. Introduction

Information Disorder [1] describes the intentional and unintentional circulation of misleading information in the public sphere. Misleading information can be broadly categorised as: (1) *misinformation*, i.e., false information shared without the intention to harm, (2) *disinformation*, false information shared with the intent to harm, or (3) *malinformation* which refers to genuine information meant to be private, shared to public spheres for malicious purposes. Information Disorder is pervasive in online mediums in the current digital era. For instance, individuals can come across false advertisements produced by companies to promote the sale of their products [2]. Such false claims manipulate consumers into buying products they do not need but otherwise pose only a minimal risk to them. Information Disorder can also lead to much more harmful consequences, e.g., individuals refusing vaccines against deadly diseases due to misinformation about their side effects [3, 4], or deliberate propaganda circulated by domestic or foreign forces manipulating public's political opinions [5, 6, 7].

Information Disorder is particularly worrisome in online environments as it directly hinders information access. Regularly, individuals turn to search engines as the first point for information discovery on diverse topics, e.g., the weather, news, and healthcare. In response to the user's search inquiries, popular search engines provide a list of resources but not all are genuine and factual sources of information [8, 9]. Search engines are no longer the only portal for information discovery. People nowadays also rely on social media platforms like YouTube or TikTok and voice-based virtual assistants like Siri or Alexa [10, 11]. These platforms offer new ways of accessing information; they also introduce new challenges related to Information Disorder. For example, users browsing social media, often without actively

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searching for information, are anyway exposed to a range of content they interpret as information [12]. Integrating generative AI technologies into information access tools has exacerbated the proliferation of false and misleading information online [13, 14, 15]. Given the increasing pervasiveness of Information Disorder in our everyday lives, extensive research efforts have been allocated to study and address the issues related to Information Disorder—from investigating reasons for users’ vulnerability to Information Disorder [e.g. 16, 17, 18] to detecting and mitigating Information Disorder [e.g. 19, 20, 21, 22] along with interventions to empower digital citizens against Information Disorder [e.g. 23, 24]. Most efforts, however, have examined the issue concerning the general population, i.e., English-speaking adults from the global north [25].

A user group known for their extensive use of online information access tools who visibly differ from mainstream users are *children*¹. They are at a point in their life when they become cognizant of the world around them and develop their principles and opinions. The information they encounter during this phase plays a vital role in their development [27]. However, they do not possess the critical thinking skills to discern the credibility of resources encountered on online information access tools [28, 29]. They also tend to trust the Internet and often do not judge the nature of the source believing all content they encounter to be factual [29, 30]. Given children’s in-development cognitive abilities and distinct expectations from information access tools, we argue that their needs and challenges related to Information Disorder differ from those of mainstream users. This makes it crucial to understand what research efforts have been undertaken on the topic of Information Disorder with children specifically as the main stakeholders.

In this work, we conduct a systematic literature review to gain a comprehensive overview of research related to online Information Disorder and children’s information access. For our review, we focus on literature that considers children as distinct stakeholders and their perceptions instead of an external person acting as their proxy. Our analysis through the lenses of the Interactive Information Retrieval (IIR) community involves various perspectives encompassing the user demographics and struggles, online tools and platforms studied, as well as the solutions proposed to address the highlighted struggles of this user group. Based on the knowledge distilled from our analysis, we discuss open challenges and propose future research directions, reflecting on the technical and ethical challenges that researchers may encounter when advancing research in this area.

2. Literature Selection Process

In this section, we describe the process used to gather and select manuscripts to inform our analysis; the different stages of this process are shown in Figure 1.

To gather the set of publications that anchors our comprehensive overview of research related to children and online Information Disorder, we formulate a search query capturing keywords reflecting term variations related to children (e.g. child, teen, adolescent) and online Information Disorder (e.g. misinformation, disinformation, fake news). Given their global research coverage, we rely on two popular databases: DBLP² and SCOPUS³. We adjusted the search query to abide by the syntax of each in the considered databases. For SCOPUS we limit the results to works published in venues related to computer science due to the database’s wider coverage, unlike DBLP which is a database for computer science research literature specifically. We also limited SCOPUS search results to English publications but could not do so in DBLP due to limitations in offered search features. The final search queries used in the databases are listed below.

```
#KEYWORD QUERY
(child* OR kid* OR youngster* OR teen* OR adolescent*)
AND
(misinformation OR disinformation OR credibility OR pollution
  OR "fake news" OR malformation OR "Information Disorder")
```

¹UNICEF’s Convention on the Rights of the Child [26] defines a child as any individual below the age of 18.

²<https://dblp.org/>

³<https://www.scopus.com/search/form.uri?display=basic#basic>

```

#DBLP
(child*|kid*|youngster*|teen*|adolescent*)
(misinformation|disinformation|credibility|
  pollution|fake news|malinformation|Information Disorder)

#SCOPUS
TITLE-ABS-KEY (
  ( misinformation OR disinformation OR credibility
    OR "information pollution" OR "fake news"
    OR malinformation OR "Information Disorder")
  AND ( child* OR kid* OR teen* OR adolescen* OR youngster*)
)
AND ( LIMIT-TO ( SUBJAREA,"COMP" ) )
AND ( EXCLUDE ( DOCTYPE,"cr" ) )
AND ( LIMIT-TO ( LANGUAGE,"English" ) )

```

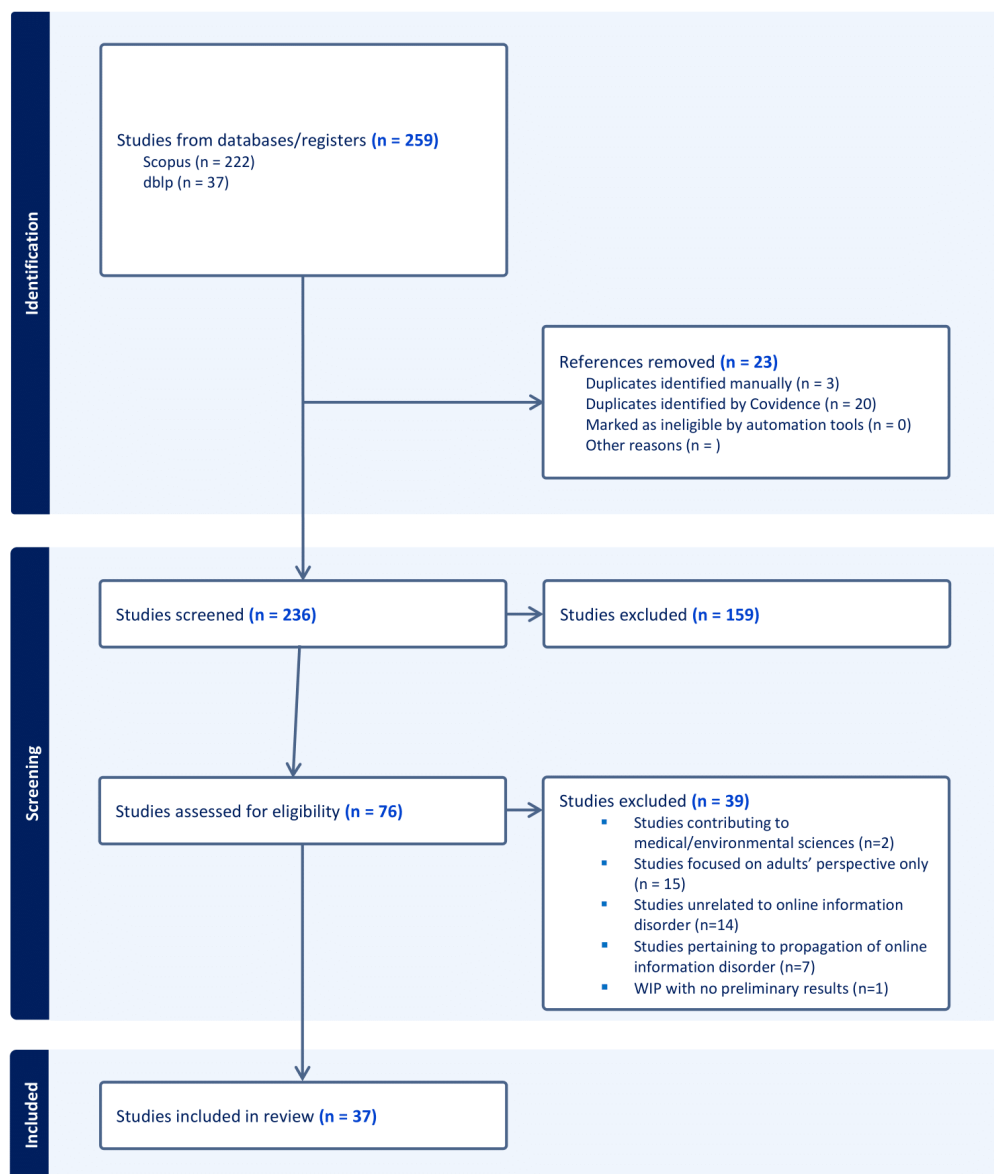


Figure 1: PRISMA flowchart showing the search procedures used in the review (Source: Covidence).

The search yielded 259; removing 23 duplicate works led to the 236 publications which two authors screened in two phases using Covidence⁴, an online systematic review tool. In the first phase, the authors individually ascertained the relevance of each work for analysis using its title and abstract based on the following inclusion criteria:

- The target user group is (or consists of) children.
- The term “child” (and related terms) is used to describe human children.
- Terms related to online Information Disorder (such as “credibility”) are used in the same context in the title and abstract.
- The online content under consideration adheres to the definition of Information Disorder, i.e., content considered misinformation, disinformation, or malinformation.

Following the first screening phase, only 76 publications remained. The prominent drop in publications was largely due to the context in which the query terms were used in the excluded publications. For example, publications discussing the propagation of misinformation in a network that used the term “child” to refer to a child *node* in a graph were excluded; so were publications discussing misinformation in healthcare related to *kidney* diseases which were retrieved due to the term “kid*” in the search query.

In the second phase, the authors scanned the full body of the remaining publications and excluded those contributing to medical or environmental sciences, considering adults’ viewpoints only as a proxy for children’s experiences, unrelated to online Information Disorder, or about the propagation of Information Disorder in social networks. The second screening phase resulted in 38 publications; one was excluded as it described a user study but no preliminary results were discussed. Thus the final set of publications for analysis is comprised of 37 publications.

3. Emergent Themes

We analyse the selected manuscripts (Section 2), via an inductive thematic analysis approach [31]. The manuscripts were split randomly between two authors to look for patterns—from an IIR lens—in the purpose, target population, methodology, and findings reported in each manuscript. The analysis resulted in nine themes; for an overview of the themes and the associated manuscripts see Table 1.

Theme#1: Research venues & perspectives. To gain an overview of the research efforts related to Information Disorder and children, we consider the publication venue of the reviewed manuscripts, in addition to the focus of the research presented in these manuscripts. Among the 37 manuscripts reviewed, 20 were published in peer-reviewed journals, 15 in conferences, and the rest in workshops and symposiums. Although 37 manuscripts is a limited number compared to those referring to Information Disorder in general, the fact that most of the manuscripts focus on children are part of journals and conference proceedings, indicates that Information Disorder with children as the main target is an area of interest for a wide group of researchers and not limited to niche research groups. Most of these manuscripts were published in Social Sciences (21), Information Science (9), or Human-Computer Interaction venues (6). Despite limiting our search to publications related to computer science and the context of online Information Disorder being closely related to Information Retrieval (**IR**), only one manuscript, i.e., [49], was published in a core IR venue, raising a critical concern on the limited efforts from the IR community in this area.

In terms of research focus, 23 manuscripts explore, through user studies and empirical analysis, different aspects of the interaction between children and online information. Additionally, another 14 manuscripts propose strategies to support children’s struggles with Information Disorder, ranging from proposals aimed at the child’s cognitive learning to more concrete solutions to educate children to tackle Information Disorder. Overall, we find that research efforts so far have largely focused on children and not much on the systems that the child uses to access information.

⁴<https://www.covidence.org/>

Table 1

Theme overview along with their associated publications.

Theme	Description	Associated Publications
Research venues & perspectives	Overview of most common research communities and perspectives when advancing knowledge on Information Disorder as it pertains to children	[32, 33, 34, 35, 36, 37, 38, 39, 28, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 12, 54, 55, 56, 57, 58, 59, 23, 60, 61, 62, 63, 64, 65]
Age	How Information Disorder is addressed across different age groups within the broad category of children	[32, 34, 35, 36, 37, 38, 39, 28, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 12, 54, 55, 57, 58, 59, 23, 60, 61, 63, 64, 65]
Ethnography	How ethnographical attributes and external factors can impact children's exposure to Information Disorder	[32, 34, 35, 36, 37, 38, 28, 41, 40, 42, 43, 44, 45, 46, 48, 50, 51, 52, 12, 54, 56, 57, 58, 59, 23, 60, 62, 63, 64, 65, 61, 55, 39]
Perception	How children perceive Information Disorder and its prevalence in their lives	[34, 37, 41, 43, 44, 47, 60]
Discerning Information Disorder	Strategies that children undertake to identify Information Disorder	[34, 37, 41, 42, 47, 54, 60, 59, 65, 64, 63]
Context-dependent vigilance	The role of context and social factors in children's interaction with online information	[32, 41, 42, 47, 48, 52, 59, 65]
Information & media literacy	Children's understanding and knowledge of information access systems	[34, 35, 36, 37, 40, 41, 44, 47, 48, 49]
Research outcomes	Strategies and solutions proposed by the research community to assess children's Information Disorder	[32, 34, 38, 40, 43, 44, 45, 47, 52, 54, 60]
Relevant vs. Useful	The trade-off between accuracy and comprehension when children access information	[64, 37, 49]

Theme#2: Age. More than 85% of the manuscripts (32 out of 37) explicitly define the age range of the population probed—whether via user tests or empirical studies. Among these 32 papers, 8 focus on primary and middle school children, 9 examine high school students, and 15 address children spanning both primary and secondary school years, highlighting some differences between age groups [52, 34, 55, 37, 48]. It emerges from these works that the ability of children to assess information evolves with age. For primary school children, online content interpretation depends more on personal experiences or emotional responses rather than on objective criteria [52]. Younger children are less likely to compare multiple sources, making them more vulnerable to misinformation [37, 48]. Moreover, they struggle to detect fake news without any initial training, despite their high cognitive reflection scores [28]. High school children, instead, exhibit a more advanced approach to credibility evaluation. Studies indicate that they are more likely to check the source of information, compare multiple sources, and rely on external references when assessing information [46, 55, 42, 52]. These findings suggest an improvement in judging online information due to greater experience and school education, leading to the development of more critical thinking skills.

Theme#3: Ethnography. As the majority of the manuscripts consist of studies involving human participants (33 out of 37), ethnographical attributes inherent to the participants stood out, particularly the gender and country of origin of the examined population under study.

From a gender diversity perspective, 23 papers report the gender ratio of participants; most works adopt a simplified binary gender definition with few exceptions [34, 38, 43, 46, 47, 50, 23]. Largely, participants reflect a gender-balanced population (from a binary perspective), which suggests that the

insights gained from the analysis are generalizable to children of either gender.

From a geographical perspective, except for the user study conducted in [43], each study targeted a specific country, covering a total of 17. Specifically, 43% of the user studies involve children from the USA [e.g. 28, 40] and another 43% children from European countries [e.g. 32, 35]. The studies focus on understanding and addressing the challenges children face due to their inherent limited cognitive abilities. Nevertheless, socio-economic factors like financial status or ethnicity—although sometimes reported when describing the participants—are never considered as a factor influencing the reported conclusions. This lack of a cultural component in the analysis is acknowledged as a limitation in only a small subset of user studies under review [35, 61, 33]. Studies involving children from Singapore [56] and Brazil [65] indicate that external factors, such as the influence of political and religious ideologies and report that such socio-economic factors also have a prominent influence on how children access information online and their perception of Information Disorder. Similarly, in the interviews conducted by Jean et al. [37], children expressed a lack of trust in their government, influencing the online sources they prefer when accessing information about their health.

Theme#4: Perception. Adults often believe children to be naive and unaware of online Information Disorder [41]. However, findings from 11 user studies involving focus groups or interviews with children to discuss their preferences when accessing information online, reveal that contrary to popular belief, children are aware of online Information Disorder but possess a limited perception of what constitutes online Information Disorder [41, 44].

Children equate Information Disorder to content that is “obviously false” [41] often relying on their “gut feeling” to ascertain whether the information is to be trusted or not [64, 43]. If children deem an online resource trustworthy, they consider it a reliable source of information and rarely reflect on the content presented in the source. For example, in a study conducted by Jean et al. [37], they observed children search for keywords that match their inquiry to determine if the information is suitable for their information needs without paying attention to the context the keywords are used. Children also tend to assume the benevolence of the content creator and do not consider the creator’s intentions behind producing the content [34, 60]. The direct consequence of their presumed benevolence of the author was observed in a study conducted by Hartwig et al. [47] in which children failed to recognise the misleading information in satirical content.

Theme#5: Discerning information disorder. Given the recurrent theme of children’s (limited) awareness of online Information Disorder, we look for common strategies that children undertake—consciously or otherwise—to tackle Information Disorder. It became apparent that children consider various factors to ascertain if they should trust the information they encounter. Most often these factors are surface-level elements such as the amount of information and graphics presented, the vocabulary, and the tone of writing [37, 64, 59]. Some studies report that children consider source attributes such as the author’s domain expertise and presence of evidence to support the information, to ascertain the credibility of an online resource [34, 37, 42]. Social factors like the source’s popularity as well as other people’s reactions to the particular piece of media also influence the child’s decision on whether to trust the information or not [41, 47, 59, 42]. They tend to exhibit confirmation biases, relying on their prior knowledge of the subject to determine if the information can be trusted [34, 41, 47].

Children seem to account for various factors when determining whether online resources are to be trusted. However, studies that examine children’s process of evaluation find children to do so in a very heuristic manner [44, 65, 63, 54]. For instance, while using the presence of supportive evidence to evaluate the quality of the information, children struggle with assessing the quality of the evidence in corroboration with the information [34, 60]. Children’s inability to reason deeply is also reflected in the vague and sometimes irrelevant reasons they provided when prompted to justify their evaluation of the quality of information presented on an online resource [34, 41, 65].

Theme#6: Context-dependent vigilance. Despite children's self-reported awareness of Information Disorder and their vigilance to tackle it, there appears to be a huge discrepancy between what they report to do versus what they have been observed to do [59, 65]. Children's trust in online information is heavily dependent on the context in which they access the information. Children are more critical of the online content they consume when they actively seek information about their personal interests or education [65]. Even in these scenarios, however, children often accept the first response they receive from the information access system for their inquiry [48, 52] and compare different sources only when exposed to contrasting viewpoints [52]. A classroom setting can also sometimes make children lenient in their critical analysis as seen in a study conducted with children in a primary school in the Netherlands [32] wherein some participants reported feeling shocked that they were unable to realize the information provided under the guise of a classroom assignment was fake information despite having received training in media literacy. In the case of information access for leisure and entertainment, children undertake a very different approach to ascertain the trustworthiness of the content. Instead of analysing the content, they focus on social factors such as the popularity of the content and other people's reaction to it [41, 47, 59, 42].

Theme#7: Information & media literacy. Looking at the challenges highlighted in user studies and addressed in proposed solutions, close to 30% of the manuscripts (10 out of 37) focused on children's ability to assess online information being influenced by their understanding of the tools they use to access it. According to [47, 48] many children tend to trust algorithms, such as AI or Google, blindly believing the accuracy of the information. Since they do not yet have the literacy skills to assess credibility [37, 49], without any tool or knowledge to question online information, they remain vulnerable to algorithms, which hinders the development of their critical thinking skills [36, 41]. On the other hand, information access tools often reinforce this blind trust. Transparency regarding algorithms is not commonly addressed when developing new technical solutions and many children lack understanding of how algorithms work [36, 35]. Moreover, the rise of digital influencers leads this vulnerable group to trust everything they promote, without fully understanding the dynamics behind social media [39]. Even though children may be cautious about online information sources, their limited media literacy and understanding of Information Disorder prevent them from critically evaluating the content [41, 44].

Theme#8: Research outcomes. From the review, it emerges that only 14 out of 37 manuscripts offer solutions or strategies to address challenges faced by children in relation to Information Disorder. Although limited in number, these proposals aim to address the different needs of children as information seekers by considering the challenges from distinct points of view. However, findings suggest that most research efforts prioritize children over the systems they use to access online information, resulting in a gap in algorithmic solutions specifically tailored for them.

Without proposing definitive solutions, 6 papers offer techniques that can be adopted to enhance children's evaluation of online information. The work of Kiili et al. [34], for example, suggests that longer deliberation on the credibility of sources leads to more accurate evaluations among children. Additionally, three studies [51, 45, 38] indicate that increasing awareness of the importance of credibility evaluation encourages them to adopt a more critical approach to the quality of the encounter information. Promoting emotional engagement has also been identified as effective in tackling Information Disorder [34], acknowledging the influence of emotions on how children assess information. Furthermore, research by [54] suggests that enhancing reading skills can improve children's ability to evaluate the credibility of information. While these insights point to cognitive developmental interventions as potential solutions to combat Information Disorder, 8 out of the 14 papers suggest a more educational approach, with a range of solutions designed to engage children and enhance their skills. Interactive lessons and hands-on activities—such as serious games or classroom exercises to create fake content—have been shown to improve their critical thinking skills [45, 32, 38, 40, 54]. Some studies focus more on interface design solutions, such as incorporating warning labels or increasing transparency of the source attributes [47, 64], which can provide visual cues to help children recognize misleading information.

Furthermore, using verification tools, such as fact-checking apps, has proven beneficial in discerning fake news from credible information [43].

Theme #9: Relevant vs. useful From an IR viewpoint, an online resource is relevant if it meets the user's information needs. For children, however, relevance goes beyond resources matching the keywords expressed in a query or prior user interactions. For instance, the online content's emotional undertone as well as its alignment with the sentiment in the child's search query plays an important role in relevance from a child's point of view [66, 67]. Children's perceived complexity of the content also influences which resource they choose to engage with [66, 49]. Findings from two user studies [64, 37] highlight a similar tradeoff in children's online search behaviour between what children deem to be the "best" response to their inquiry and which response they find to be helpful, i.e., comprehensibility of the content in the online resource is sometimes more important to children than the reliability of the source. This tradeoff presents a unique perspective on the kind of resources children would deviate towards when seeking information, which can also influence children's exposure to misleading content as discussed in another reviewed manuscript - [49]. However, none of the other reviewed papers provide insights into this perspective.

4. Discussion

In this section, we reflect on the knowledge distilled from our literature analysis and discuss open problems, research directions, and potential challenges that may hinder research aimed at supporting children's information access in the presence of Information Disorder.

Revising the concept of Information Disorder. In their majority, reviewed manuscripts discuss children dealing with fake news which is one aspect of the much broader Information Disorder concept[1], overlooking components such as disinformation, malinformation, and in general any intentional or unintentional circulation of misleading or misinterpreted information. Further, the definition of Information Disorder looks at online content from two aspects—the falseness and intent to harm [1]. Both these aspects rely on the source and at most the propagator of the content, and not the consumer. However, in the case of children, genuine information lacking any intent to harm can also be misleading due to children's inability to interpret the content appropriately (e.g. satirical content) [36, 41, 47]. This distinction between misinformation and misinterpretation is particularly important when analysing children's interaction with online content, emphasizing the need to re-evaluate and expand our understanding of Information Disorder to include the cognitive challenges children face when interpreting even credible content. In other words, future research is needed to help reshape the definition of this concept when considering children.

Inclusive user studies. Researchers tend to generalise findings based on observations of children at a specific age to a much broader age group. However, in the first 18 years of their lives, children go through various developmental phases that influence how they perceive the world around them [27]. This raises the question of whether findings from existing literature that focus on specific ages truly apply to the full spectrum of the definition of 'children'. Furthermore, most insights reported in Section 3 reflect the perceptions and behaviour of children from the global north. In an expert survey conducted by Blair et al. [25], there is a prominent difference in the intervention strategies that experts believe would be effective for (general) populations from the global north and south for combating misinformation. Based on the impact of cultural and socio-economic factors on children's information-seeking behaviour [56, 65, 37], the difference may persist for children. This issue may also be exacerbated in children given the influence of social factors in their natural strategies to identify Information Disorder [41, 47, 59, 42].

Another aspect that underlies the challenge of inclusivity—particularly noted to be lacking in user studies in the reviewed manuscripts—is the impact of language on children's struggles with Information

Disorder. Familiarity with the language can greatly influence the way a person interprets content and with English being the lingua franca of the Internet [68, 69], the problem of Information Disorder for children growing up in non-English speaking communities may be exacerbated.

Designing algorithms for retrieval, ranking, and filtering of resources to address Information Disorder on online platforms based on the knowledge acquired from the aforementioned studies can only be expected to cater to and/or reflect the needs and expectations of the children belonging to the communities represented in the studies. While a valuable starting point, to enable the design of inclusive solutions that more broadly tackle children's struggles with online Information Disorder, future user studies would benefit from exploring the differences in children's behaviour across developmental stages as well as extending the reach of their research to involve children from different cultural communities.

ROMCIR from children's perspective. The IR community has conducted extensive research to understand user perception and challenges related to the problem of Information Disorder [e.g. 70, 71, 72, 73]. It has also developed algorithms to detect and mitigate misleading information on online platforms [e.g. 19, 20, 21, 22]. These algorithms however do not address the problem as it pertains to children. A clear indication of the absence of children's perspective in the designed solutions is the data used to train and validate these algorithms.

Datasets related to Information Disorder like FEVER [74] and LIAR [75] contain content that mostly adults are exposed to and labelled as genuine or fake from an adult's perspective. However, in the case of children, even genuine content can contribute to Information Disorder. For example, children struggle to differentiate between factual and opinionated content, relying on both as objective sources of information [40]. Limited reading and critical thinking skills also lead them to misinterpret content such as satire [47]. With this in mind, we argue that existing IR algorithms must be validated against labelled datasets that contain content that constitutes Information Disorder as it pertains to children. Unfortunately, such datasets do not exist. This gap highlights the need for more targeted resources that reflect children's interaction with online information. To enable research in this direction, the IR community must also allocate effort to create such representative datasets.

Children as research subjects. Online resources children are exposed to potentially influence their development [49]. This makes it crucial for the research community to not only focus on how children interact with misleading information but also consider the ethical implications of exposing them to such content. The study by Loos et al. [32] highlights the benefits of teacher or parental involvement in mitigating the adverse consequences of exposure to content that is preemptively known to elicit emotional duress in children. Their study suggests that guidance from trusted adults can help children better contextualize and critically engage with the encountered information, reducing the risk of harm. Similarly, Landoni et al. [49] argues that ensuring a safe and positive online experience for children needs expert guidance. However, since most of the reviewed user studies directly expose children to possible harmful content, it is also important for researchers to ensure that children have a solid understanding of its reliability.

As children may not fully comprehend the risks associated with participating in user studies, it is fundamental for researchers to obtain explicit consent both from children and their guardians, clearly explaining the implications and the nature of the study, as well as how their data will be used [76]. Furthermore, recent work has emphasized the value of engaging children not only as passive testers but as active collaborators in studies [49]. This participatory approach, coming from the "child as protagonist" principle [77], ensures that research is more inclusive and reflective of children's experiences. When they are directly involved in the design process, they become experts in the field, making more valuable contributions to understanding how they deal with online Information Disorder. By considering children as researchers' partners, studies can better account for their unique cognitive, emotional, and developmental needs, leading to more inclusive outcomes.

Finally, children are not merely miniature adults; they have distinct needs [78, 79]. As it emerged from our review, they navigate and interpret online information in unique ways, challenging the traditional

concept of Information Disorder [1]. Their ability to engage with, understand, and evaluate online content differs from that of the general population, demanding a tailored approach in the research field. While it is crucial to involve children in the research process, there is a need to design more tailored and accurate studies that reflect children's cognitive abilities and respect their needs and perceptions when dealing with online Information Disorder.

Scaffolding for independence. Children are at a stage in their lives where they are developing their sense of self and becoming cognizant of the world around them. The opinions and personal beliefs they form at this age greatly influence the choices they make and the information they consume has a strong influence on their development [27]. Due to the pervasiveness of digital technology, online platforms are the most common source of information for children. Even when not actively seeking information, they come across content that they perceive as information. Amid never-ending exposure to information, often in the absence of adult supervision, children need to be empowered to tackle the problem of Information Disorder independently.

Preventive algorithms that detect and mitigate misleading online content can support children in combating Information Disorder. However, it is impossible to anticipate every scenario of Information Disorder for children and prevent children's exposure to it. Moreover, an overtly protective ecosystem also hinders children from developing the essential digital skills they need to become independent. Hence, rather than a protectionist approach, research must adopt a holistic approach that introduces children to online Information Disorder in a manner that enables them to distinguish genuine factual sources of information from misleading online content.

For the IIR community, a holistic approach would entail going beyond optimising resource retrieval for children to retrieval and ranking of resources that may require critical reflection on the presented content. For instance, children must read and interact with an IAS response to extract information from it and given that children are often drawn to resources that evoke emotional engagement [67], developing novel (re-)ranking strategies that rank resources with content that aligns with the affective expectations of the child during their search task could promote the child's engagement with the resources. Children also tend to be more critical when exposed to multiple and contrasting points of view [52], novel child-centred retrieval and ranking strategies could be developed to retrieve resources that provide information from multiple (factual) perspectives, possibly some of which are also conflicting in nature.

Interdisciplinary research. The digital environment alone cannot bear the responsibility of children's development. To ensure the feasibility of proposed solutions to address the problem of Information Disorder for children, the IIR community must adopt a more interdisciplinary approach that combines cognitive, educational, and technical interventions. Further, technological solutions can support children's skill development only when children are taught to make use of the scaffolding. This can be enabled by revising school curriculums to raise awareness amongst children about Information Disorder from an early age and inculcate the habit of using information access systems with a critical mindset.

5. Concluding Remarks

This work offers a comprehensive overview of the status quo of research in computer science on online Information Disorder, specifically concerning children. We present our findings in a summary table that future researchers can consult to enhance their understanding of this topic. Through our literature analysis based on the lenses of the IIR community, we identified nine themes that highlight different perspectives on the issue of information disorder as it relates to children.

Although children are aware of misleading information, they struggle to recognize Information Disorder, often relying on gut feeling or superficial cues. This difficulty primarily stems from their limited media and information literacy, which leads them to blindly trust any algorithm behind information access tools. Additionally, their approach to managing information disorder is influenced by their

young age and various ethnographic factors, including cultural and socio-political contexts. This underscores the importance of including children from diverse cultural and socio-economic backgrounds in research. In general, we noted that research community efforts to combat children's Information Disorder are predominantly published in Social Science and Human-Computer Interaction venues, proposing educational interventions and cognitive strategies to improve the critical thinking and credibility assessment skills of this vulnerable group. Therefore, we advocate for direct involvement of the IR community by possibly following the outlined research directions, which combined with our reflections on the potential challenges, provide valuable guidance for shaping future research and practical implementations to address the problem.

In today's digital era, children frequently turn to online information access tools for both learning and leisure. In this work, we largely focus our discussion on children's struggles with Information Disorder when they actively search for information. However, we must also acknowledge that not all the content they come across is through active information seeking. With the increasing presence of recommender algorithms on the platforms that they visit, particularly in social media platforms such as YouTube and TikTok [80], the distinction between active information-seeking and passive exposure to content—which children may view as informative—is becoming less clear. To navigate this landscape effectively, children must be equipped with the essential digital skills to recognise Information Disorder when exposed to online content “out in the wild” [81]. For this, it is crucial not only to reflect on what the research community has done to understand the problems that hinder children's *information discovery* and the associated risks but also what remains to be done to enhance children's overall *access to online information*, for which our literature review may serve as the needed spark of inspiration.

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