



UPPER SECONDARY SCHOOL STUDENTS' CREDIBILITY ASSESSMENT OF SCIENTIFIC CONTENT ON INSTAGRAM

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Abstract. *Social media are central areas for adolescents' engagement with science but also environments for misinformation.*

This challenges adolescents' ability to assess the credibility of scientific content. So far, little is known about how adolescents assess credibility on social media. Building on empirical studies and frameworks of credibility and combining self-reports, performance data, and written justifications, this study examined how Austrian upper secondary school students (N = 1,055) use social media and how they assess the credibility of scientific Instagram posts. Self-report data were analysed descriptively and via exploratory factor analysis. Written justifications were examined using qualitative content analysis. The students reported limited use of social media for scientific information.

19 self-report items concerning the procedure for assessing credibility clustered into four factors aligned with theoretically grounded credibility perspectives: design, trustworthiness, social validation, and content. When assessing Instagram posts, students often applied one credibility perspective at a time and changed credibility perspectives across posts. The weak alignment between self-reported and actual credibility assessment suggests a reliance on heuristics over systematic reasoning, reducing assessment reliability.

These findings highlight challenges for science education, strengthening adolescents' science media literacy and metacognitive awareness, and for science communication, making credibility cues explicitly visible and interpretable in fast-paced, visually driven environments.

Keywords: *credibility assessment, Instagram, science education, upper secondary school students, science communication*

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Introduction

Currently, social media platforms such as Instagram, TikTok, and YouTube are no longer used only for entertainment and social interaction. Rather, they serve as sources of information, especially for adolescents (Belova et al., 2022; Brossard, 2013; Kresin et al., 2024; Pérez-Escoda et al., 2021), and are utilized by science communicators to engage with the public (Deng, 2024). These platforms are also used in science education to promote content knowledge (Abualrob, 2025; Büssing et al., 2022) and an understanding of the nature of science in society (Höttecke & Allchin, 2020). Although social media use has been positively associated with trust in science (Huber et al., 2019), a major challenge is that these platforms lack systematic quality control, placing evidence-based content alongside misinformation (Aberšek, 2021; Allchin, 2022). On social media, various mechanisms contribute to the spread and internalisation of misinformation: low media literacy and reliance on heuristics at the individual level, information cascades and social validation in the form of likes at the group level, and political polarisation at the societal level (Scheufele & Krause, 2019). Consequently, users must filter reliable scientific information from a flood of content (Metzger & Flanagin, 2013), while science communicators compete not only with entertainment content but also against science denialists who undermine public trust in science and democracy (Allchin, 2022; Cinelli et al., 2022; Gierth & Bromme, 2020).

The challenge of assessing the credibility of information presented on social media and in other online environments is not restricted to specific cultural regions. International research from a range of countries highlights that all population groups struggle to distinguish between misinformation and scientifically sound information and that this issue is particularly acute for adolescents (Ali & Qazi, 2023; Allchin, 2022; Esimokha & Mustapha, 2023; Forzani, 2018; Freeman et al., 2020; Hämäläinen et al., 2021; Kiili et al., 2022; Kresin et al., 2024; Marttunen et al., 2021; Pérez-Escoda et al., 2021; Pothitou et al., 2025; Schubatzky & Haagen-Schützenhöfer, 2023). As with other laypeople, adolescents often rely on superficial heuristics, such as visual design and social endorsement, instead of employing systematic reasoning when assessing the credibility of online information (Belova et al., 2022; Kresin et al., 2024; McGrew & Byrne, 2020; Ou & Ho, 2024). Reliance on such heuristics may be efficient, but it also leaves users vulnerable to misleading information (Metzger & Flanagin, 2013).



Although prior research has explored adolescents' engagement with science on social media (Belova et al., 2022; Kresin et al., 2024; Majcen & Spitzer, 2024; Zilz & Höttecke, 2025), empirical knowledge about the practices they apply to assess credibility is still limited. However, sound empirical insights are needed to effectively foster media literacy among adolescents, and to tailor science communication to the needs of this age group (Cinelli et al., 2022). Media literacy is essential for dealing with scientific misinformation (Scheufele & Krause, 2019) as well as for gaining an understanding of the nature of science in society (Höttecke & Allchin, 2020; Marangio & Gunstone, 2020).

This study addresses this gap in the literature by examining how Austrian upper secondary school students assess the credibility of scientific Instagram posts. Using a mixed-methods approach, the media behaviour of students, the scientific topics they engage with, and the criteria they apply to assess credibility are analysed. The findings can practically and theoretically inform both science education and science communication, with the aim of strengthening the understanding of science among adolescents on and through social media. Thus, this study contributes empirically to answering the internationally relevant question of how adolescents deal with information on social media.

Social Media: Platforms for Science Communication Amid the Spread of Misinformation

Social media are web-based platforms that enable individuals to create profiles, communicate instantly, and share multimedia content. These platforms are characterised by elements of the culture of digitality (Stalder, 2018): algorithmicity, referentiality, and communality. Social media enable personalized content flows, participatory meaning-making, and networked communities. However, these platforms are also rife with algorithmic bias, echo chambers, misinformation, and potentially addictive use patterns (Karakose et al., 2022; Tülübaşı et al., 2023), which may affect how users process and assess information. Social media, especially Instagram, play a prominent role in adolescents' everyday lives in relation to entertainment and accessing information on societal and scientific topics (Avci et al., 2025; Kresin et al., 2024; Medienpädagogischer Forschungsverbund Südwest [MPFS], 2024; Tülübaşı et al., 2023).

In addition to scientists, who are increasingly using social media to communicate science and engage directly with society (Deng, 2024), scientific content is often shared on social media by laypeople who have no relevant expertise. This can be problematic because social media allows for rapid and largely uncontrolled content dissemination, modification, and commentary (Aberšek, 2021; Allchin, 2022), such that distorted, outdated, and misleading content can be presented as scientific knowledge. Such misleading content is referred to as misinformation (Treen et al., 2020). Therefore, users, including adolescents, are constantly exposed to both misinformation and evidence-based scientific content. Navigating this environment requires specific competences, including the ability to assess the credibility of social media posts (Allchin, 2022; Höttecke & Allchin, 2020; Jones-Jang et al., 2021; Marangio & Gunstone, 2020; Polanco-Levicán & Salvo-Garrido, 2022; Scheufele & Krause, 2019).

Credibility Perspectives in Social Media Contexts

Credibility is commonly defined as an audience-shaped perception of believability (Fogg, 2003; Hovland et al., 1953) that comprises two components: perceived trustworthiness and perceived expertise. Several frameworks describe how individuals assess the credibility of information, but do not address social media contexts. Fogg (2003), for example, addressed online information in the pre-social media era by distinguishing four perspectives on credibility assessment: presumed credibility, which is based on general assumptions; surface credibility, based on design and language; reputed credibility, based on third-party endorsement; and earned credibility, based on prior positive experience. These perspectives generally refer to the credibility assessment of digital information but can also be applied to the credibility assessment of information on social media. Although this typology covers essential perspectives on credibility assessment, it largely ignores performing a plausibility check of content. Especially in fast-paced environments such as Instagram, credibility is often assessed through quick plausibility checks, which is often based on prior knowledge or gut feeling (Belova et al., 2022; Freeman et al., 2023; Zilz & Höttecke, 2025).

Bromme and Kienhues (2014) proposed two perspectives for assessing credibility, similarly omitting social media contexts: a plausibility perspective ("What is true?"), which relies on coherence and prior knowledge, and a trustworthiness perspective ("Whom can I trust?"), which focuses on the intentions and reliability of the source. Building on this, Zilz and Höttecke (2025) argued that plausibility-based reasoning can lead to misjudgements if people lack sufficient background knowledge, and thus emphasise the importance of explicitly fostering trust-based reasoning among students at school. This is particularly important because it is often difficult for students

to recognise and adequately interpret relevant credibility cues for trust-based reasoning (Belova et al., 2022; Kresin et al., 2024; Zilz & Höttecke, 2025).

The two frameworks described so far (Bromme & Kienhues, 2014; Fogg, 2003) do not address social media. However, more recent research has focused on credibility assessment by adolescents in social media environments. In particular, there are small-sample qualitative studies and topic-specific studies, for example, on health information and climate change information (Belova et al., 2022; Freeman et al., 2023; Kresin et al., 2024; McGrew et al., 2018; Majcen & Spitzer, 2025; Zilz & Höttecke, 2025). For instance, Kresin et al. (2024) empirically identified four perspectives that adolescents adopt when assessing the credibility of climate-related content on Instagram: [1] Who (source credibility), [2] What (content plausibility), [3] How (presentation and format), and [4] Opinion of others (social validation). In addition, Zilz and Höttecke (2025) showed that students apply plausibility, trust, and surface perspectives to assess the credibility of climate change information on social media, with the plausibility perspective being the most common. Although the perspectives identified by Kresin et al. (2024) and Zilz & Höttecke (2025) are compatible with existing credibility frameworks (Bromme & Kienhues, 2014; Fogg, 2003) and reflect social media-specific affordances, their findings are limited in thematic scope and sample size. Accordingly, further studies that are less topic-specific and involve larger samples are needed to investigate adolescents' credibility assessment of information on social media.

Heuristics and Criteria for Assessing Credibility

The credibility perspectives described in the preceding subsection (Bromme & Kienhues, 2014; Fogg, 2003; Kresin et al., 2024) can be processed either intuitively, based on heuristics, or analytically, based on criteria (Chaiken, 1980; Fogg, 2003; Kammerer & Gerjets, 2014). Both intuitive and analytical credibility assessment practices are based on what are known as credibility cues, which are implicitly or explicitly perceptible to users. For instance, when users apply a trustworthiness perspective to assess credibility on Instagram, they may pay attention to credibility cues such as conflicts of interest and the expertise of the content creator (Zilz & Höttecke, 2025).

Credibility assessment of online content is often implemented intuitively using heuristics, which are mental shortcuts that simplify complex judgments (Fogg, 2003; Metzger et al., 2010). Heuristics are grounded in recurring reasoning patterns that are consistent across humans and are therefore not arbitrary (Tversky & Kahneman, 1974). On visually oriented platforms such as Instagram, heuristics help users to quickly assess the credibility of content without engaging in systematic analysis (Metzger & Flanagin, 2013). Adolescents, in particular, often rely on heuristics when assessing information on social media (Belova et al., 2022; Freeman et al., 2020; Freeman et al., 2023; Kresin et al., 2024; McGrew & Byrne, 2020). Credibility cues are thus noticed unconsciously, and based on these cues, credibility judgments are made. When it comes to assessing the credibility of Instagram content, the following heuristics are particularly relevant: (a) reputation heuristics, which refer to judgments based on perceived expertise, such as the status and/or institutional affiliation of the content creator and previous experience with the source (Fogg, 2003; Metzger & Flanagin, 2013; Prike et al., 2024; Scholz-Crane, 1998); (b) endorsement heuristics, which focus on institutional seals, social recommendations (likes, and comments), and search rankings (Ali et al., 2022; Choi & Stvilia, 2015; Fogg, 2003; Metzger & Flanagin, 2013); (c) aesthetic heuristics, which rely on spelling and design quality (Fogg, 2003; Freeman et al., 2023; Miniukovich & Figl, 2023); (d) persuasive intent heuristics, which involve recognising advertising (Chang et al., 2024; Hilligoss & Rieh, 2008; Maggio et al., 2020; Metzger et al., 2010); and (e) expectancy violation heuristics, which are based on comparing content with prior knowledge (Chang et al., 2024; Fogg, 2003).

Heuristics are often combined and applied unconsciously (Dietz & Bolte, 2024). They reflect widespread assumptions about credible information and enable efficient judgments. However, when applied uncritically or in isolation, they can lead to bias or error. Notably, heuristic, intuitive credibility assessments can evolve into more conscious credibility assessments based on criteria acquired through experience, reflection, and instruction (Gigerenzer & Todd, 1999). This has important implications for media literacy education. Through targeted support and reflective practice, media literacy learners can be encouraged to go beyond heuristics by adopting explicit criteria for credibility assessment. Such credibility assessment is no longer purely intuitive but analytical (Forzani, 2018; Metzger & Flanagin, 2013). Content or posts would then be deliberately analysed for relevant credibility cues, with credibility judgments made based on this analysis. For example, media literacy learners may know that citing sources can be an important credibility criterion and may therefore look for relevant credibility cues. In educational contexts, fostering the ability to formulate and apply such criteria is a central goal in promoting scientific and media literacy (McGrew, 2020; Marangio & Gunstone, 2020; Zilz & Höttecke, 2025).

Several studies have examined which credibility cues adolescents (claim to) look for, either intuitively or analytically, when assessing credibility on social media (Belova et al., 2022; Kresin et al., 2024; Zilz & Höttecke, 2025). Theoretical frameworks further highlight desirable credibility cues for well-founded judgments (Allchin, 2022). Table 1 presents a selection of such credibility cues for assessing scientific social media content based on qualitative studies, theoretical literature, and empirical research. This overview shows that adolescents report looking for both superficial and cognitively demanding cues. Some cues, such as scientific reasoning and source verification, align with evidence-based assessment and should be strengthened through education (Allchin, 2022; McGrew et al., 2018), while others, such as number of likes and visual cues, may be misleading and require critical discussion (Belova et al., 2022; Kresin et al., 2024). Empirical findings indicate that even when adolescents refer to specific credibility cues, it often remains unclear whether they analytically or intuitively look for these cues (Kresin et al., 2024). The distinction between the reflective use of credibility cues and intuitive shortcuts remains a central challenge for credibility research. Understanding how adolescents apply credibility cues is essential for designing educational interventions that foster critical media literacy among this age group.

In addition, especially in fast-moving social media environments, adolescents often do not pay attention to credibility cues and instead follow their intuition (Belova et al., 2022; Zilz & Höttecke, 2025) or rely on their content knowledge (Belova et al., 2022; Zilz & Höttecke, 2025). Although credibility assessments based on sound content knowledge are useful, judgments based on intuition can be misleading. Furthermore, adolescents often struggle to access the soundness of their content knowledge on a given topic. For this reason, it is necessary to encourage critical reflection on one's content knowledge and to provide other helpful credibility cues (Zilz & Höttecke, 2025).

Table 1
Credibility Cues Adolescents Use to Assess Social Media Content

Credibility cue	Empirical or theoretical underpinnings
Account/Profile: Identity and reliability of the account or the content creator	Belova et al. (2022), Kresin et al. (2024)
Advertising: Promotional content and its intent	Belova et al. (2022), Kresin et al. (2024)
Cross-Referencing the same information against other independent sources	Allchin (2022), Belova et al. (2022), McGrew et al. (2017), Zilz & Höttecke (2025)
Citation of Sources: References to scientific studies or sources	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018)
Links to Further Information: Presence of links to additional, in-depth material	Belova et al. (2022), Kresin et al. (2024), Tseng (2018)
Expertise of Content Creator: Qualifications or scientific background of the content creator	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018), Zilz & Höttecke (2025)
Conflict of Interest: Possible financial or ideological biases of the content creator	Allchin (2022), McGrew et al. (2018), Zilz & Höttecke (2025)
Verification Status of the Account/Profile (e.g., blue check marks)	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018)
Visual Appearance of People in the Post	Allchin (2022), Zilz & Höttecke (2025)
Number of Likes	Belova et al. (2022), Kresin et al. (2024)
Number of Comments	Belova et al. (2022)
Quality of Comments: Tone, relevance, and arguments in the comments	Kresin et al. (2024), McGrew et al. (2018)
Graphic Quality: Quality of the images and layout (e.g., colour composition, image sharpness, AI generation)	Belova et al. (2022), Kresin et al. (2024)
Linguistic Quality: Spelling, grammar, and overall language quality	Belova et al. (2022), Tseng (2018), Zilz & Höttecke (2025)
Scientific Reasoning: Presence of scientific explanations, logical arguments, or data-based reasoning	Belova et al. (2022), Tseng (2018)
Balanced Presentation: Presence of different perspectives (pros and cons)	Belova et al. (2022)
Emotional Appeals	Belova et al. (2022), Tseng (2018)



Research Aim and Research Questions

The theoretical background to this study and the identified research gaps highlight that adolescents' credibility assessments on social media are shaped by source-related, content-based, and platform-specific credibility cues. Nonetheless, there remains a need to clarify which of these credibility cues adolescents are actually looking for in practice, particularly in highly visual environments such as Instagram. Furthermore, there is the question of the extent to which the credibility cues adolescents report attending to in practice combine with the individual credibility perspectives they adopt when assessing credibility.

Although distinct credibility perspectives are described in the literature, these perspectives have thus far been developed either without consideration of social media or in context-specific settings (Bromme & Kienhues, 2014; Fogg, 2003; Kresin et al., 2024; Zilz & Höttecke, 2025). Existing studies have suggested that adolescents often rely on heuristics but do not consistently articulate or apply analytical criteria (Kresin et al., 2024). Furthermore, the question arises, of how aware adolescents are of what credibility cues they are looking for when assessing the credibility of social media content. Research linking self-reported credibility assessment practices with actual credibility assessment of authentic social media content provides an opportunity to draw further conclusions regarding whether the credibility assessment practices implemented by adolescents are predominantly intuitive or analytic. In addition, analysing the extent to which individual credibility assessment practices are applied to different posts can provide insight in this regard.

Therefore, this study aimed to develop a perspective-based framework that captures how Austrian upper secondary school students assess the credibility of scientific content on Instagram. A further goal was to examine the extent to which these adolescents were aware of the credibility assessment practices they used. By recruiting a large, heterogeneous sample and analysing credibility assessments across different scientific topics, this study aimed to contribute to a more comprehensive and transferable understanding of how adolescents assess scientific information in social media environments. The following are the research questions addressed:

- RQ1: Which social media platforms do Austrian upper secondary school students predominantly use to obtain information and acquire knowledge?
- RQ2: What topics do the posts and reels viewed by Austrian upper secondary school students on social media fall under?
- RQ3: What credibility perspectives do Austrian upper secondary school students apply when assessing the credibility of scientific Instagram posts, and how do these relate to theoretically derived models and their reported credibility assessment practices?
- RQ3.a: What credibility assessment practices do Austrian upper secondary school students self-report using when assessing the credibility of Instagram posts?
- RQ3.b: To what extent can Austrian upper secondary school students' self-reported practices for assessing credibility on Instagram posts be categorised based on established credibility perspectives?
- RQ3.c: How do Austrian upper secondary school students assess four preselected Instagram posts on various scientific topics?
- RQ3.d: What established credibility perspectives (RQ3.b) do Austrian upper secondary school students adopt to assess the credibility of Instagram posts?
- RQ3.e: To what extent do Austrian upper secondary school students adopt the same credibility perspectives when assessing different Instagram posts?
- RQ3.f: To what extent do the self-reported behaviours and actual practices of Austrian upper secondary school students align regarding their credibility assessments of Instagram posts? (RQ3.a & RQ3.d)

Research Methodology*General Background*

This exploratory-descriptive study employed a mixed-methods design to examine how upper secondary school students assess the credibility of scientific information on social media. The study is based on established research on credibility assessment in general (Bromme & Kienhues, 2014; Fogg, 2003) and in the context of social

media (Kresin et al., 2024; Zilz & Höttecke, 2025). Data were collected in Austria during the summer semester of 2024 using an online questionnaire distributed to secondary school students. Distribution was carried out by teachers, who were contacted via mailing lists.

Sample

This study is based on data collected through an online questionnaire of upper secondary school students aged 14–19 from all nine federal states of Austria. This age group was chosen as the focus of this research because adolescents are increasingly exposed to information via social media and are potentially developing lasting patterns in how they assess the credibility of social media content. In addition, current data from the Programme for International Student Assessment 2022 show that only 44% of 15-year-olds in Austria feel confident in their ability to recognise misinformation. This result, which is well below the Organisation for Economic Co-operation and Development average, underscores the urgent need to strengthen the media literacy of this age group (Dombrowski et al., 2025). Furthermore, in Austria, minors are allowed to use social media independently only from the age of 14. Therefore, this age group is a critical target population for educational interventions aimed at promoting competence in assessing the credibility of social media content.

To recruit a broad and diverse sample, a convenience sampling approach was employed. Upper secondary school students were recruited via teacher mailing lists and direct contact with teachers from different school types across all nine federal states of Austria. This approach was appropriate for the exploratory aim of the study. Teachers were asked to only forward the questionnaire link to students, without integrating it into classroom activities, so that the questionnaire could be completed in the participant’s free time.

A total of $N = 1,055$ upper secondary school students completed the questionnaire (Table 2). This sample size is sufficient for the purposes of this exploratory study, as the sample comprised adolescents from all federal states and different types of schools. Furthermore, both the self-reported data and the credibility assessments indicate that additional data would not have revealed any new response patterns (saturation). Data analyses were performed on the entire sample, as the goal was to identify overarching credibility assessment patterns and not to determine group differences. However, generalisability is limited by the sample characteristics. Previous research on adolescents’ credibility assessments of social media posts have primarily been small-scale qualitative studies (Belova et al., 2022; Kiili et al., 2022; Kresin et al., 2024), which have yielded valuable but context-specific insights. In contrast, this study adopts a large-scale mixed-methods perspective.

Table 2
Sample Description

Gender	Age	School type	School level	Federal state of Austria
Male = 367	16.04 ±1.17 years	AHS = 699	9th grade = 267	Burgenland = 12
Female = 677		BMS = 3	10th grade = 415	Carinthia = 64
Nonbinary = 11		HAK = 60	11th grade = 208	Lower Austria = 153
		HLW = 222	12th grade = 147	Upper Austria = 162
		HTL = 70	13th grade =18	Salzburg = 19
		BAfEP = 1		Styria = 450
			Vorarlberg = 34	
			Vienna = 157	

Instruments and Procedures

The questionnaire was conducted using LimeSurvey. The questionnaire was created in German and included (a) self-assessment items on social media behaviour, (b) self-assessment items on personal credibility assessment practices, (c) credibility assessments of four Instagram posts, and (d) written justifications for each credibility assessment.



Social media behaviour (RQ1 & RQ2)

To examine upper secondary school students’ social media use, the study participants were asked how they use the following platforms (Saferinternet.at, 2024): BeReal, Discord, Facebook, Instagram, Pinterest, Snapchat, Signal, Telegram, TikTok, Twitch, WhatsApp, X, and YouTube. Responses were given on a 4-point Likert scale, with the following rankings: not at all, for entertainment and relaxation, for social interaction, and for obtaining information and acquiring knowledge (Kresin et al., 2024). The adolescents also indicated how often (never, several times a month, several times a week, or daily) they consume content on specific topics, including architecture and design, beauty, nutrition, fashion, fitness, gaming, health, climate change, culture, life hacks, mobility, nature, sustainability, parties, politics, travel, news, technology, economy, and science.

Self-reported credibility assessment practices (RQ3.a, RQ3.b, & RQ3.f)

Because there is no quantitative instrument for assessing adolescents’ credibility assessment practices on social media, 19 new self-report items were developed for this study. These items were derived from theoretical and empirical research on credibility in general, as well as in the context of social media (Table 1). The original content, based on English-language sources, was translated into German using DeepL, developed into items, and refined through communicative validation within the research team. A team member with an academic background in English language studies checked the wording for conceptual and linguistic correctness. Items were rated on a 4-point Likert scale, ranging from strongly disagree to strongly agree. Two examples of the self-report items are as follows: “I pay attention to whether the post is advertising,” and “I research the post’s author’s expert status.” The complete list of items is presented in Table 3.

To improve face validity, the entire questionnaire was pretested with student assistants at the bachelor level, and feedback was obtained on the clarity and comprehensibility of the items. Adjustments to individual items were made based on this feedback. The psychometric properties of the newly developed items were empirically examined. An exploratory factor analysis (EFA) was conducted to examine the underlying structure of the items and assess construct validity. The internal consistency of the resulting factors was assessed using Cronbach’s alpha (see Data Analysis and Results).

Table 3
Items for Evaluating Upper Secondary School Students’ Self-reported Practices in Assessing the Credibility of Social Media Content

Item	Source
To assess the credibility of posts on social media ...	
I take a closer look at the account/profile associated with the post.	Belova et al. (2022), Kresin et al. (2024)
I pay attention to whether the post is advertising.	Belova et al. (2022), Kresin et al. (2024)
I research whether I can find the same information in other sources.	Allchin (2022), Belova et al. (2022), McGrew et al. (2017), Zilz & Höttecke (2025)
I make sure that sources and scientific studies are cited in the post.	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018)
I look out for links to further information.	Belova et al. (2022), Kresin et al. (2024), Tseng (2018)
I research the post's author's expert status.	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018), Zilz & Höttecke (2025)
I pay attention to possible conflicts of interest of the post's author.	Allchin (2022), McGrew et al. (2018), Zilz & Höttecke (2025)
I trust my common sense.	Belova et al. (2022), Zilz & Höttecke (2025)
I pay attention to the verification of the channel.	Belova et al. (2022), Kresin et al. (2024), McGrew et al. (2018)
I pay attention to the appearance of people in the post.	Allchin (2022), Zilz & Höttecke (2025)
I pay attention to the number of likes.	Belova et al. (2022), Kresin et al. (2024)
I pay attention to the number of comments.	Belova et al. (2022)
I pay attention to the quality of comments.	Kresin et al. (2024), McGrew et al. (2018)
I pay attention to the quality of graphics.	Belova et al. (2022), Kresin et al. (2024)



Item To assess the credibility of posts on social media ...	Source
I pay attention to the linguistic quality (spelling, grammar).	Belova et al. (2022), Tseng (2018), Zilz & Höttecke (2025)
I pay attention to scientific explanations and arguments in the post.	Belova et al. (2022), Tseng (2018)
I pay attention to a balanced presentation of the information (pros & cons).	Belova et al. (2022)
I trust my knowledge about the subject of the post.	Belova et al. (2022), Tseng (2018)
I pay attention to whether attempts are made to address certain feelings/emotions.	Belova et al. (2022), Tseng (2018)

Credibility assessment of Instagram posts (RQ3c, RQ3d, RQ3e, & RQ3.f)

Upper secondary school students assessed the credibility of four preselected Instagram posts, which were presented as screenshots of publicly available content. For data protection compliance, the names of the commenters were anonymized. Posts 2 and 3 were originally posted in English and were translated into German using DeepL. Communicative validation was performed within the research team, which included a team member with an academic background in the English language. The four posts addressed different scientific topics and possessed different characteristics (e.g., design, source citation, and credibility). Based on expert ratings, Posts 1 (breastfeeding) and 4 (sunscreen) were classified as credible (c), while Posts 2 (electric cars) and 3 (Ozempic) were deemed not credible (nc). The post characteristics are summarised in Table 4. The participants indicated whether or not they found each post credible. To simulate typical Instagram scrolling behaviour, a time limit was implemented. In addition, the adolescents were asked to justify their credibility ratings. To do this, three short text fields were provided in the questionnaire for each post. More than three fields might have lengthened the questionnaire. This format was chosen instead of a single large text field to increase the likelihood of receiving multiple justifications and to avoid overly brief responses.

Table 4
Instagram Posts Used in the Study

Post	Statement	Post characteristics						
		Content	Content creator	Verification	Design	Sources	Scientific explanations	Social evidence
1	Breastfeeding mothers who received the COVID-19 booster passed the virus-neutralizing antibodies on to their children through breast milk.	Is in line with the state of scientific knowledge	University professor for science communication with a background in molecular biology	No	Prepared in a simple way, with a dog shown as logo	Intended source and link to original publication	Scientific explanations in the caption	Divided opinion in the comments, with few likes
2	Electric cars pollute 1,850 times more than fuel-based vehicles.	Not in line with the state of scientific knowledge: conspiracy theory	Private person without relevant expertise	No	Designed as a news report; hashtags: #climatehoax	reference to study, no source cited	None	Comments in agreement, with few likes
3	Four injections of Ozempic lead to weight loss.	Misleading presentation of the state of scientific knowledge	Holds a Dr. title, with expertise in the field of gastroenterology	Yes	Advertising, woman in white coat	None	Shortened presentation of information	Divided opinion in the comments, with very many views

Post	Statement	Post characteristics						
		Content	Content creator	Verification	Design	Sources	Scientific explanations	Social evidence
4	Sunscreen is also worth using in fall and winter.	In line with the state of scientific knowledge	Public television channel with focus on science communication	Yes	Graphics not professionally designed: colour scheme, & selection of images	sources cited	Yes, including limitations of scientific studies	Negative comment

Data Analysis

Social media behaviour (RQ1 & RQ2)

Data on upper secondary school students’ social media use were analysed descriptively, taking into account the absolute number of students who reported using each social media platform for different purposes. Mean values and standard deviations were calculated for the self-reported data regarding the topics consumed by the adolescents.

Self-reported credibility assessment practices (RQ3.a & RQ3.b)

First, the participants’ responses to the 19 self-report items (Table 3) were analysed descriptively. Second, an EFA was conducted to examine whether the items could be grouped based on established credibility perspectives. Principal component analysis with varimax rotation was used. Data suitability was checked using the Kaiser–Meyer–Olkin measure and Bartlett’s test of sphericity. Factor retention was guided by the Kaiser criterion (Eigenvalues > 1) and scree plot inspection. Items with cross-loadings or low factor loadings were excluded based on theoretical considerations. The internal consistency of each factor was assessed using Cronbach’s alpha (α).

Credibility assessment of Instagram posts (RQ3.c, RQ3.d, RQ3.e, & RQ3.f)

The participants’ assessments of the four Instagram posts were analysed using descriptive statistics and qualitative content analysis (Kuckartz, 2018). Descriptive analysis was implemented to calculate the percentage of participants who correctly classified each post as credible or not. This analysis was based on previous expert ratings of the posts. In addition, written justifications regarding the credibility assessment of the students were analysed in MAXQDA 24 using deductive categorical content analysis (Kuckartz, 2018). The main categories were based on factors extracted from the EFA (Table 8), and the 19 items (Table 3) served as subcategories; where needed, inductive subcategories were added. Coding was conducted independently by two researchers—one from the core research team, and one external coder trained using a communicatively validated manual. Interrater reliability was calculated using MAXQDA’s Inter-coder Agreement function.

To analyse whether upper secondary school students applied similar credibility perspectives across all posts, MAXQDA’s Document Profile function was applied to generate perspective profiles per post, which were exported and analysed descriptively, based on absolute counts and percentages. This quantified the perspectives identified in the justifications for the credibility assessments of each Instagram post for each student. Using this data, a chi-square test of independence was performed to analyse associations between the participants’ adopted credibility perspectives and the post they assessed. In addition, Mann–Whitney U tests were conducted to examine whether adolescents who correctly assessed a post reported applying different perspectives than those who did not.

Comparison of self-reporting with actual analysis (RQ3f)

To examine whether the participants’ self-reported credibility assessment practices corresponded to their actual justifications, a Spearman correlation analysis was performed. The analysis was based on factor scores from



the EFA (Table 8), not on individual items (Table 3). This data correlated with the quantified data on perspectives identified in the justifications for the credibility assessments of individual Instagram posts for each student.

Ethical Considerations

The online questionnaire was conducted outside of school hours, and the adolescents were informed that participation was voluntary and could be discontinued at any time without consequences. Only adolescents aged 14 years and older were eligible to participate, as this age group in Austria is allowed to give their consent to participate in surveys independently, and social media may only be used from the age of 14 years onwards. Adolescents younger than 14 years were excluded from the survey by automatically terminating the questionnaire after they entered their age. At the beginning of the questionnaire, the participants received information about the purpose of the study, data protection, anonymity, and the voluntary nature of participation. Participants had to give their consent digitally before filling out the questionnaire. Formal approval from schools or education authorities was not required, as the study was conducted independently of school lessons. The data were collected anonymously and stored securely in accordance with data protection regulations.

Research Results

Social Media Behaviour of Austrian Upper Secondary School Students

Table 5 summarises how the students reported using various social media platforms. Based on the responses of the participants in this study sample, YouTube, Instagram, TikTok, and Pinterest are the platforms most frequently used to obtain information.

Table 5

Absolute Frequencies of Upper Secondary School Students' Use of Different Social Media Platforms for Various Purposes (N = 1,055)

Social media platform	Purpose of use			
	Not at all	For entertainment and relaxation	For social interaction	For obtaining information
BeReal	678	193	254	55
Discord	689	158	299	41
Facebook	937	43	29	63
Instagram	117	787	569	409
Pinterest	365	510	43	285
Snapchat	148	324	822	96
Signal	923	13	119	4
Telegram	991	18	42	15
TikTok	290	721	302	343
Twitch	816	230	30	9
WhatsApp	7	138	969	153
X	899	101	26	93
YouTube	89	894	89	487

Table 6 presents the participants' self-assessment of how often they consume content on specific topics on social media. The results show that in this study sample, topics such as nutrition, fitness, and fashion are consumed more frequently than economy and finance, climate change, or technology.

Table 6*Upper Secondary School Students' (N = 1,055) Self-Reported Engagement with Topics on Social Media Platforms*

Topic	M	SD
Architecture & Design	2.04	0.87
Beauty & Cosmetics	2.45	1.20
Nutrition	2.92	0.97
Fashion	2.81	1.10
Fitness	2.82	1.02
Gaming	2.10	1.20
Health & Medicine	2.32	0.89
Inspiration & Motivation	2.62	1.01
Climate Change	1.80	0.77
Art & Culture	2.16	0.99
Life Hacks	2.03	0.92
Mobility	1.86	0.93
Nature & Animals	2.64	1.01
Sustainability	1.84	0.82
Party	2.16	1.04
Politics	2.08	0.97
Travelling	2.69	0.98
Daily News	2.51	1.07
Technology	1.83	0.94
Economy & Finance	1.78	0.88
Science & Research	2.03	0.91

Self-reported Credibility Assessment Practices of Austrian Upper Secondary School Students

Table 7 presents descriptive statistics on the participant's self-reported practices in assessing the credibility of social media content. Overall, the adolescents in this study sample predominantly reported relying on common sense, checking for advertising, and considering spelling and grammar. The less commonly mentioned credibility assessment practices included verifying authors' expertise or identifying potential conflicts of interest.

Table 7*Upper Secondary School Students' Self-Reported Practices in Assessing Credibility of Social Media Content*

To assess the credibility of posts on social media ...	M	SD
I take a closer look at the account/profile associated with the post.	2.85	0.80
I pay attention to whether the post is advertising.	3.10	0.95
I research whether I can find the same information in other sources.	2.25	0.96
I make sure that sources and scientific studies are cited in the post.	2.19	0.94
I look out for links to further information.	2.33	0.88
I research the post's author's expert status.	1.83	0.86
I pay attention to possible conflicts of interest of the post's author.	1.96	0.91
I trust my common sense.	3.32	0.72
I pay attention to the verification of the channel.	2.59	0.91

To assess the credibility of posts on social media ...	M	SD
I pay attention to the appearance of people in the post.	2.92	0.85
I pay attention to the number of likes.	2.58	0.99
I pay attention to the number of comments.	2.23	0.97
I pay attention to the quality of comments.	2.48	1.05
I pay attention to the quality of graphics.	2.78	0.87
I pay attention to the linguistic quality (spelling, grammar).	3.06	0.93
I pay attention to scientific explanations and arguments in the post.	2.89	0.93
I pay attention to a balanced presentation of the information (pros & cons).	2.54	0.88
I trust my knowledge about the subject of the post.	2.96	0.79
I pay attention to whether attempts are made to address certain feelings/emotions.	2.63	0.90

Factor Analysis on Self-reported Credibility Assessment Practices

To examine whether the 19 items (Table 3) reflect distinct credibility perspectives that the students in this study sample adopt when assessing credibility on social media, an EFA was performed using principal component analysis with varimax rotation. The Kaiser–Meyer–Olkin measure was .851, and Bartlett’s test of sphericity was significant, with $\chi^2(171) = 5,455.66$ and $p < .001$, confirming the data’s suitability for factor analysis. Based on the Kaiser criterion (Eigenvalues > 1) and scree plot, four factors were extracted, accounting for 51.36% of the variance. Each factor represents a distinct perspective for credibility assessment. Table 8 presents the factor loadings of the individual items and Cronbach’s alpha values for the extracted credibility perspectives. All Cronbach’s alpha values were greater than .7, which indicates acceptable internal consistency.

Table 8

Factor Loadings of Upper Secondary School Students’ Self-Reported Practices in Assessing the Credibility of Social Media Content, with Cronbach’s Alpha Values of Extracted Factors

To assess the credibility of posts on social media ...	Factor				Credibility perspective
	1	2	3	4	
I pay attention to the linguistic quality (spelling, grammar).	.77				Design ($\alpha = .757$)
I pay attention to scientific explanations and arguments in the post.	.73				
I pay attention to a balanced presentation of the information (pros & cons).	.62				
I pay attention to whether the post is advertising.	.54				
I pay attention to the quality of graphics.	.48		.44		
I pay attention to the appearance of people in the post.	.37		.42		
I pay attention to the verification of the channel.	.40				
I pay attention to whether attempts are made to address certain feelings/emotions.	.37	.36			Trustworthiness ($\alpha = .766$)
I research the post’s author’s expert status.		.78			
I pay attention to possible conflicts of interest of the post’s author.		.75			
I make sure that sources and scientific studies are cited in the post.		.61			
I look out for links to further information.		.61			
I research whether I can find the same information in other sources.		.53			
I take a closer look at the account/profile associated with the post.	.41	.38			

To assess the credibility of posts on social media ...	Factor				Credibility perspective
	1	2	3	4	
I pay attention to the number of comments.			.85		Social validation ($\alpha = .743$)
I pay attention to the number of likes.			.82		
I pay attention to the quality of comments.			.65		
I trust my common sense.				.86	Content
I trust my knowledge about the subject of the post.				.75	

Using the EFA, a perspective-based framework was derived from the self-reported items, which were developed based on empirical and theoretical research on credibility assessment on social media platforms. The perspective-based framework comprised the following four credibility perspectives, which follow on from research on credibility assessment (Bromme & Kienhues, 2014; Fogg, 2003; Kresin et al., 2024; Zilz & Höttecke, 2025):

The design perspective encompassed credibility assessment practices based on visual and linguistic credibility cues, such as the graphic quality of posts, spelling, grammar, and the presence of scientific explanations. The item “I pay attention to whether attempts are made to address certain feelings or emotions” was excluded due to low factor loadings and cross-loadings. The item “I pay attention to the appearance of people in the post” had a low factor loading but was assigned to the design perspective due to conceptual considerations, as aspects such as clothing or appearance differ from typical social validation cues such as the number of likes. Furthermore, removing this item would have reduced the value of the Cronbach's alpha.

The trustworthiness perspective comprised assessment practices related to credibility cues regarding the credibility of the content creator or source. These include, for example, the content creator's expertise or the citing of sources. The item “I take a closer look at the account/profile associated with the post” had a low factor loading and low cross-loadings, although it had a slightly higher factor loading than that for the design perspective. However, it was conceptually considered to fit the trustworthiness perspective and was therefore assigned to this perspective. Including this item in the trustworthiness perspective also increased internal consistency.

The social validation perspective comprised credibility assessment practices that focus on credibility cues regarding audience interaction, such as the number of likes and comments. Additionally, the content perspective included credibility assessment practices that focus on the perceived plausibility of posts instead of credibility cues. Internal consistency was not calculated due to the limited number of items ($n = 2$). “I trust my common sense” reflects intuitive plausibility, and “I trust my knowledge about the subject of the post” refers to prior content knowledge.

Credibility Assessment of Instagram Posts

Most participants ($N_{total} = 1,055$) correctly classified Post 3, the Ozempic post (nc; 93.08%), and Post 4, the sunscreen post (c; 86.35%), while a majority misclassified Post 1, the breastfeeding post (c; 71.18%), as not credible. Similarly, 22.37% of the participants incorrectly assessed Post 2, the electric cars post, which is a nc post, as credible.

Qualitative Findings: Perspectives Adopted in Assessing the Credibility of Instagram Posts

Of the total sample ($N = 1,055$), 531 participants provided justifications for all four posts, 167 participants provided justifications for three posts, 90 participants provided justifications for two posts, 92 participants provided justifications for one, and 175 participants provided no justifications for any post. All responses were included in the analysis. The deductive coding scheme was based on the four factors identified in the EFA, which are both empirically supported and theoretically grounded (Bromme & Kienhues, 2014; Fogg, 2003; Kresin et al., 2024). Subcategories were derived from the items assigned to each factor (Table 8). The subcategory “global trustworthiness of social media” was added inductively and applied when the participants referred to the credibility of social media platforms in general. Intercode agreement for the four posts was $\geq 77.41\%$. Table 9 presents the number of upper secondary school students who applied each credibility perspective to each Instagram post, along with the total codes and selected justifications (translated from German). The results show that all four perspectives were applied in the credibility assessments of the four Instagram posts. Trustworthiness and design were the most widely applied, while social validation and content were the least applied of the four credibility perspectives.

A chi-square test of independence showed a significant association between the perspective adopted and the post assessed, with $\chi^2(12) = 191.70$, $p < .001$, $N = 5,584$. Adjusted standardized residuals ($|z| \geq 1.96$) indicate that design appeared more often for “sunscreen” ($z = 2.6$; obs.: 407, exp.: 358.6) and less for “electric cars” ($z = -4.7$; obs.: 272, exp.: 360.4). Trustworthiness was overrepresented for “breastfeeding” (c) ($z = 4.8$; obs.: 429, exp.: 340.5) and underrepresented for “Ozempic” (nc) ($z = -4.4$; obs.: 250, exp.: 329.4). Social validation occurred significantly more often for “electric cars” (nc) ($z = 6.3$; obs.: 216, exp.: 141.5), but less for “sunscreen” (c) ($z = -5.8$; obs.: 72, exp.: 140.8). Content appeared more often for “Ozempic” ($z = 4.2$; obs.: 335, exp.: 266.6) and less for “breastfeeding” ($z = -3.7$; obs.: 215, exp.: 275.6).

To examine whether participants who correctly classified a post reported adopting different credibility perspectives than those who misclassified that post, Mann–Whitney U tests were conducted. A post hoc power analysis (G*Power 3.1) was performed to assess the robustness of the group comparisons. Based on group sizes, $\alpha = .05$, and $1 - \beta = .80$, critical effect sizes were calculated for each post ($r_{\text{post1}} = .125$; $r_{\text{post2}} = .135$; $r_{\text{post3}} = .219$; $r_{\text{post4}} = .163$). Only results that exceed these thresholds are interpreted because smaller, nonsignificant effects carry a high risk of type II error. For the post on “breastfeeding” (c) ($N_{\text{correct}} = 304$; $N_{\text{incorrect}} = 751$), participants who correctly assessed the post as credible predominantly reported adopting the trustworthiness perspective ($U = 94783.5$, $Z = -4.975$, $p < .001$, $r = .153$; $M_{\text{correct}} = 1$, $M_{\text{incorrect}} = 0$) and the design perspective ($U = 99289$, $Z = -4.112$, $p < .001$, $r = .127$; $M_{\text{correct}} = 0$, $M_{\text{incorrect}} = 0$). For the post on “electric cars” (nc) ($N_{\text{correct}} = 819$; $N_{\text{incorrect}} = 236$), the trustworthiness perspective ($U = 78485.5$, $Z = -5.455$, $p < .001$, $r = .168$; $M_{\text{correct}} = 0$, $M_{\text{incorrect}} = 0$) and the social validation perspective ($U = 78883.5$, $Z = -6.711$, $p < .001$, $r = .207$; $M_{\text{correct}} = 0$, $M_{\text{incorrect}} = 0$) were applied more often by students who assessed the post correctly. For the post on “Ozempic” (nc) ($N_{\text{correct}} = 911$; $N_{\text{incorrect}} = 144$), correct credibility assessment was associated with a large number of trustworthiness arguments ($U = 48895$, $Z = -6.102$, $p < .001$, $r = .188$; $M_{\text{correct}} = 0$, $M_{\text{incorrect}} = 0$).

Table 9

Frequencies of Students' Justifications for Credibility Assessments across Four Instagram Posts, Organised by Main and Subcategory

Main category	Subcategory	N_{students} (N_{codings}) Posts on breastfeeding (c)	N_{students} (N_{codings}) Posts on electric cars (nc)	N_{students} (N_{codings}) Posts on Ozempic (nc)	N_{students} (N_{codings}) Posts on sunscreen (c)	Selected justifications
No justification		245	308	290	318	
Social validation perspective		151 (173)	216 (251)	131 (138)	72 (76)	
	Profile reach	11 (11)	22 (22)	15 (16)	15 (15)	“has not reached many people” (1257_I2); “the channel has many followers” (439_I1)
	Number of likes	64 (64)	96 (96)	15 (15)	42 (42)	“The post has an extremely high number of likes because many believe it is true” (1376_I3); “too few likes in my opinion” (244_I1)
	Number of comments	4 (4)	22 (22)	2 (2)	2 (2)	“few comments” (1381_I4); “there are lots of likes and comments” (1304_I4)
	Quality/content of comments	90 (95)	93 (94)	78 (79)	17 (17)	“conspiracy theory comments” (128_I2); “the comments say that the influencer is wrong” (616_I3)
Design perspective		393 (503)	272 (332)	380 (476)	407 (536)	
	Verification	34 (34)	22 (22)	47 (47)	147 (147)	“The account is not verified on Instagram” (116_I1); “The account has a blue tick” (242_I4)
	(Scientific) explanations and arguments	117 (122)	101 (108)	62 (68)	145 (157)	“detailed information was provided” (211_I1); “no more detailed information” (170_I1)



Main category	Subcategory	$N_{students}$ ($N_{codings}$) Posts on breastfeeding (c)	$N_{students}$ ($N_{codings}$) Posts on electric cars (nc)	$N_{students}$ ($N_{codings}$) Posts on Ozempic (nc)	$N_{students}$ ($N_{codings}$) Posts on sunscreen (c)	Selected justifications
	Emotions	7 (8)	13 (13)	7 (8)	1 (1)	"emotionalizing and appealing to fears" (1220_I3); "very warning and intimidating" (1297_I4)
	Appearance of people	0	0	101 (103)	0	"Just because a person with a white coat appears in a video does not mean that they are a person who has something to do with it." (13_I3); "The woman doesn't look very healthy." (435_I3)
	Balanced presentation of information	14 (14)	26 (26)	12 (13)	96 (99)	"the report is one-sided, no side effects were explained" (116_I1); "presentation of pros and cons" (961_I1)
	Quality of language	155 (176)	89 (99)	47 (51)	18 (19)	"too many hashtags" (361_I3); "spelling is not bad" (744_I2)
	Quality of graphics	36 (43)	39 (41)	48 (50)	62 (65)	"graphically well prepared" (205_I4); "the photo does not look good" (938_I4)
	Advertise- ment	9 (9)	1 (1)	88 (88)	9 (9)	"this is simply vaccination advertising" (168_I1); "typi- cal TikTok advertising" (110_I3)
Trustworthi- ness perspec- tive		429 (547)	324 (378)	250 (297)	324 (380)	
	Profile	147 (148)	132(136)	15 (15)	94 (94)	"The profile with the profile picture doesn't look very trustworthy either" (1376_I3); "name of the content creator" (499_I1)
	Author's expert status	111 (117)	34 (34)	62 (65)	50 (51)	"as it is provided by the university" (490_I1); "Is the person responsible for the contribution a doctor?" (196_I3)
	Conflicts of interest	0	4 (4)	52 (53)	0	"In the background is a Shell logo, which profits from diesel and gasoline sales" (1412_I2); "just trying to make money/reach" (27_I3)
	Same information in other sources	13 (13)	14 (14)	5 (5)	26 (27)	"other studies refute such miracle injections" (492_I3) "The study is an isolated case, as there were no other media reports on these findings from other institutes or countries." (116_I1)
	Citation of sources and scientific studies	228 (251)	185 (197)	68 (72)	208 (210)	"a study is used as a reference" (115_I2); "source reference (somewhat outdated...)" (73_I4)
	Links to additional information in addition to references	5 (5)	4 (4)	2 (2)	1 (1)	"Experts, the research and studies (which are also linked) are mentioned, the information does not come from a single person." (1297_I1); "There is no link to a study." (492_I3);
	Social media	19 (19)	4 (4)	90 (93)	2 (2)	"Instagram is not trustworthy in itself" (714_I2); "In my opinion, TikTok is not trustworthy when it comes to information." (86_I3)
Content		215 (236)	266 (298)	335 (382)	258 (279)	
	Common sense/Hear- say	173 (177)	202 (219)	202 (216)	233 (243)	"I don't believe in such weight-loss tablets/injections." (341_I3); "because I've often heard that electric cars are bad" (556_I2)
	Content knowledge	54 (59)	76 (81)	137 (153)	31 (37)	"I know that sunscreen is also important in winter because there are still UV rays, even if it's cold outside." (25_I4); "Other vaccines are also not passed on through breast milk." (110_I1)
Others		92 (95)	65 (68)	76 (79)	66 (78)	"not credible" (95_I3); "I didn't even look at it" (312_I1)



Adoption of Credibility Perspectives When Assessing Instagram Posts

To examine whether adolescents applied consistent or varying credibility perspectives across the four distinct Instagram posts, document profiles in MAXQDA 24 were generated and analysed in Excel. Table 10 shows the percentage of participants who based their justifications on a single perspective or a combination of perspectives for each post. Only participants who justified their credibility assessments were included in the analysis. The results indicate that for all four posts, more than half of the adolescents based their justification on a single perspective. The most frequent combination was design and trustworthiness. The analysis further shows that only 21 of 1,055 participants consistently used the same perspective (or perspective combination) across all four credibility assessments. An additional 117 adolescents did so for three posts, and 378 adolescents for two. In contrast, 212 adolescents applied a different perspective to each post.

Table 10
Distribution of Credibility Perspectives

Credibility perspective(s) adopted by adolescents	Post on breastfeeding (c)	Post on electric cars (nc)	Post on Ozempic (nc)	Post on sunscreen (c)
Social Validation	3.6	6.3	3.3	0.3
Design	16.1	11.5	19.9	20.9
Trustworthiness	18.4	16.6	11.3	14.2
Content	15.9	23.6	23.8	20.4
Social Validation + Design	4.2	5.8	5.3	4.7
Social Validation + Trustworthiness	4.1	7.2	1.8	0.4
Social Validation + Content	1.6	3.1	2.0	0.6
Design + Trustworthiness	19.3	10.3	10.5	19.9
Design + Content	3.3	3.2	9.3	5.3
Trustworthiness + Content	3.8	3.8	4.9	5.6
Social Validation + Design + Trustworthiness + Content	0.0	0.3	0.3	0.4
Social Validation + Design + Trustworthiness	5.8	5.2	2.0	2.4
Design + Trustworthiness + Content	3.0	0.8	2.3	3.3
Trustworthiness + Content + Social Validation	0.7	1.4	1.0	0.1
Content + Social Validation + Design	0.1	1.1	2.2	1.3

Correlation Between Self-reported and Observed Credibility Assessment Practices

The results of the implemented Spearman correlation analysis between upper secondary school students' self-reported credibility assessment practices (S_) and the credibility perspectives identified in their written justifications (J_) show weak but statistically significant correlations: S_trustworthiness was correlated with J_trustworthiness at $\rho = .202$, S_design with J_design at $\rho = .215$, and S_design with J_trustworthiness at $\rho = .242$. Although statistically significant, these correlations indicate only limited correspondence between students' self-reported credibility assessment practices and the credibility perspectives they actually applied when justifying their credibility assessments.

Discussion

Social Media Consumer Behaviour

Previous empirical studies have shown that social media is used not only for entertainment and social interaction but also for obtaining information (Kresin et al., 2024; MPFS, 2024; Pérez-Escoda et al., 2021). The findings of this



study confirm these results. However, this study sample shows variations in their preferences regarding the topics they consume on social media. Based on their self-reported information, content on lifestyle, health, and fitness is more widely consumed than scientific topics such as sustainability or climate change. This result is consistent with those of the study by Majcen and Spitzer (2024), which indicates that science communication struggles to reach young target populations on social media. However, the results do not correspond with adolescents' self-reported interests in other studies. For example, according to the JIM Study 2024 (MPFS, 2024), many adolescents show a strong interest in politics and climate change. These topics are underrepresented in the self-reported media use of this study sample. One reason for this could be the dynamics of social media, which lead users to prefer emotionally appealing and easily digestible content (Knobloch-Westerwick, 2015; Sundar & Limperos, 2013).

Self-reported Credibility Assessment Practices

This study used self-assessment items to evaluate personal credibility assessment practices based on empirical studies and theoretical research on credibility assessment in general and on social media in particular. Prior studies have documented isolated credibility assessment practices (e.g., checking likes or advertising) or individual heuristics (e.g., aesthetic or endorsement heuristics) and topic-specific research has identified credibility perspectives for particular domains, such as climate change. Building on this, this study examined how upper secondary school students' self-reported credibility assessment practices cluster into higher-level perspectives and how these perspectives relate to established theoretical models and adolescents' observed credibility assessment behaviour. Thus, this study expands the current state of knowledge on credibility assessment practices in the social media environment, as it is not topic-specific and was conducted with a larger sample than those in previous studies, which were mostly qualitative studies. The aim was to determine the extent to which the credibility assessment practices reported in previous studies are implemented in social media environments by adolescents in assessing the credibility of scientific content. Based on the self-assessment items employed, the adolescents reported using various practices to assess the credibility of social media content. These credibility assessment practices are related to various credibility cues, for example, the presence of advertisements or scientific explanations, graphic and linguistic quality, and the number of likes. An exploratory factor analysis of these self-reports revealed that the credibility assessment practices can be grouped into four distinct perspectives used by adolescents when assessing Instagram content: design, trustworthiness, social validation, and content. These credibility perspectives extend previous research by integrating insights from established credibility frameworks (Bromme & Kienhues, 2014; Fogg, 2003) and social media-specific studies (Belova et al., 2022; Kresin et al., 2024) while offering a more general and transferable perspective-based framework for understanding adolescents' credibility assessments on Instagram:

The design perspective summarises credibility assessment practices in relation to credibility cues, such as spelling, grammar, and visual layout, which have been qualitatively described for small samples and predominantly topic-specific empirical studies by, for example, Belova et al. (2022), Kresin et al. (2024), Tseng (2018), and Zilz and Höttecke (2025), as well as theoretical research by Allchin (2022). Furthermore, studies on heuristic credibility assessment have referred to design-based credibility assessment practices as aesthetic heuristics (Fogg, 2003; Freeman et al., 2023; Miniukovich & Figl, 2023) or persuasive intent heuristics (Chang et al., 2024; Hilligoss & Rieh, 2008; Maggio et al., 2020; Metzger et al., 2010). Although not specific to social media, Fogg (2003) identified a perspective on credibility assessment based on what he termed surface credibility, which refers to surface characteristics such as language and design. Regarding the assessment of climate change information on social media, Kresin et al. (2024) described the HOW perspective, which also includes credibility assessment practices regarding the design of posts. The contribution of this study is to generalise these credibility assessment practices and perspectives beyond other research conducted in topic-specific contexts. To this end, the design perspective derived using EFA in this study integrates the credibility assessment practices identified in previous research into a coherent, topic-independent credibility perspective for assessing scientific content on Instagram.

The trustworthiness perspective summarises credibility assessment practices that focus on credibility cues related to the trustworthiness of content creators and sources. These include credibility cues such as information about the expert status of content creators, possible conflicts of interest on the part of content creators, and the presence of source references or further links. Such credibility cues have repeatedly been highlighted in previous empirical studies as central to adolescents' credibility assessments (Belova et al., 2022; Kresin et al., 2024; McGrew et al., 2018; Zilz & Höttecke, 2025). Research on reputation heuristics also described credibility assessment practices linked to trustworthiness cues (Fogg, 2003; Metzger & Flanagin, 2013; Prike et al., 2024; Scholz-Crane, 1998). Furthermore, Bromme and Kienhues (2014) introduced the trustworthiness perspective alongside the plausibility



perspective as a valuable perspective for assessing the credibility of information regardless of the social media environment. Topic-specific research on the assessment of climate change information on social media also described trust-based credibility perspectives (Kresin et al., 2024; Zilz & Höttecke, 2025). The trustworthiness perspective derived from the present study extends these insights by demonstrating that trust-related credibility assessment practices combine into a coherent, topic-independent credibility perspective when adolescents assess scientific content on Instagram. Therefore, this perspective integrates findings from general credibility theory, heuristic models, and social media-specific qualitative research into a broader perspective-based framework that reflects how adolescents assess credibility beyond single topics or small-scale contexts.

The social validation perspective summarises credibility assessment practices that focus on credibility cues for the reception of a post, such as likes, comments, shares, and the number of followers. Such credibility assessment practices have been described in previous studies, sometimes in topic-specific research (Belova et al., 2022; Kresin et al., 2024; McGrew et al., 2018). In a qualitative study, Kresin et al. (2024) identified the Opinion of others perspective that students adopt when assessing credibility regarding the climate change information domain. Fogg's (2003) reputed credibility also refers to credibility assessment practices related to the reception of information. From a heuristic perspective, the social validation perspective aligns with endorsement heuristics, which also describes credibility assessment practices with respect to social recommendations (Choi & Stvilia, 2015; Fogg, 2003; Metzger & Flanagin, 2013). Thus, this study demonstrates that credibility assessment practices, heuristics, and perspectives related to how posts are received and socially approved, can be summarised into a coherent perspective that adolescents generally apply to assess the credibility of scientific content on Instagram.

The content perspective clusters credibility assessment practices that do not relate to individual credibility cues but help validate the plausibility of the content. This includes credibility assessment practices, such as comparing the content with one's content knowledge, personal beliefs, or common sense. These credibility assessment practices have been described, among others, in the studies by Belova et al. (2022), Kresin et al. (2024), and Zilz and Höttecke (2025) and discussed as a plausibility perspective (Bromme & Kienhues, 2014). In addition, such credibility assessment practices have been described as expectancy violation heuristics (Chang et al., 2024; Fogg, 2003). This study summarises these credibility assessment practices and credibility perspectives into a content perspective that adolescents adopt when assessing the credibility of scientific information on Instagram.

Credibility Assessment of Instagram Posts

When assessing the credibility of four scientific Instagram posts, the adolescents in this study sample showed considerable variation. Most of them correctly identified the misleading Ozempic post (Post 3) as not credible and the evidence-based sunscreen post (Post 4) as credible. However, over 70% falsely assessed the breastfeeding post (Post 1) as not credible, and 22% assessed the misleading electric cars post (Post 2) as credible. Analysis of the justifications provided (Table 9) indicates that adolescents often rely on surface-level cues from the design perspective or on personal familiarity with the topic (content perspective). This aligns with prior findings that highlight the use of superficial heuristics in social media environments (Belova et al., 2022; Kresin et al., 2024).

Most of the participants in this study sample applied a single perspective to justify their credibility assessments, mainly content, trustworthiness, or design. Only a minority combined perspectives, most often trustworthiness and design. This contrasts with previous findings indicating that learners often integrate multiple criteria (Dietz & Bolte, 2024; Kresin et al., 2024). One possible reason may be the study design: individual written justifications in a test-like setting likely limited elaboration, compared to think-aloud or collaborative methods used in earlier studies.

Furthermore, the adolescents in this study sample rarely applied the same perspective across all four posts. This result is consistent with findings by Kresin et al. (2024), indicating that credibility assessment is stimulus sensitive. The chi-square analysis confirmed the following: trustworthiness was more prominent for breastfeeding (Post 1), and social validation was more prominent for electric cars (Post 2). Such shifts indicate that different perspectives are triggered by specific features of the social media post, such as topic, layout, and social cues. The lack of consistency in the upper secondary school students' credibility assessments could indicate a missing repertoire of generally applicable credibility criteria. Rather, the adolescents' judgments seem to be influenced by the specific characteristics of each post, which can lead to potentially unreliable results. For example, when assessing the post on electric cars, the participants predominantly used social validation in their arguments, suggesting that they were engaging in weak critical credibility assessments and were strongly influenced by prominent social validation cues. This underscores the concern that adolescents often rely on intuitive heuristics rather than analytical strategies based on criteria (Forzani, 2018; Gigerenzer & Todd, 1999; Kresin et al., 2024; Metzger & Flanagin, 2013). However,

some open questions remain: What triggers the adoption of a particular perspective? Under what conditions do adolescents switch from heuristic to analytical processing? To answer these questions, further empirical research, such as eye-tracking studies, is needed to better understand the attention and processing patterns of adolescents when dealing with scientific content on social media.

Relationship Between Self-reporting and Performance

A notable finding of this study is the discrepancy between the credibility assessment practices reported by the upper secondary school students themselves and the credibility perspectives they actually applied when assessing the credibility of the four Instagram posts. Although the adolescents reported considering a variety of credibility cues, such as scientific argumentation, advertising, and source transparency, only weak correlations between their self-reports and their written justifications were identified. This suggests that adolescents have limited awareness of their own credibility assessment behaviours, which is consistent with previous research on information literacy (Forzani, 2018; Kammerer & Gerjets, 2014).

Limitations

This study provides important insights into how adolescents assess credibility on Instagram. However, the results are subject to several limitations. Rather than aiming for statistical generalisability, this study emphasizes transferability. Nevertheless, there are limitations to this due to the sample selected. Austria serves as a relevant case study within the European context, as adolescents across Western countries face comparable challenges in navigating social media. However, the results of this study remain situated within the Austrian context. Perhaps adolescents from different educational systems and sociocultural backgrounds apply different credibility assessment practices than Austrian upper secondary school students. Furthermore, due to the convenience sampling applied, adolescents with specific interests or media habits may be overrepresented. Therefore, future studies implementing a more representative sampling and employing cross-country comparisons are needed to capture cultural and systemic differences in adolescents' media use and credibility assessment practices.

Because this study partly relies on self-reports, the upper secondary school students may have responded in accordance with social desirability. To mitigate this limitation, the study included written justifications for credibility assessments, which provided additional insight into students' reasoning. Nevertheless, self-report bias cannot be fully excluded, and it is recommended that future studies conduct process-based methods, such as eye tracking or think-aloud protocols, to gain richer insight into adolescents' cognitive strategies.

Four Instagram posts were used in this study. Although they differed across multiple characteristics, they cannot capture the full diversity of social media content, including topics, formats, and credibility cues. Future research should therefore consider multiple social media platforms, formats, topics, and credibility cues to enhance ecological validity.

A substantial limitation concerns the written justifications. Although the qualitative content analysis of the justifications for the credibility assessments was theory-driven and characterized by adequate intercoder agreement, the interpretations are limited, as justifications varied in length and detail, and a considerable number of participants did not provide justifications at all. Consequently, some credibility perspectives may not be fully represented in the data, which may limit the reconstruction of adolescents' reasoning. Furthermore, asking adolescents to provide justifications could have encouraged a degree of reflection that goes beyond how they typically engage with Instagram content in daily life.

The cross-sectional design adopted in this study precludes causal interpretations. Although links between some credibility perspectives and the accuracy of credibility assessments were observed, the direction of these relationships remains unclear. Longitudinal or experimental designs are needed to clarify these relationships and to investigate whether specific interventions strengthen the reliability of credibility assessments.

Finally, the study findings are reflective of upper secondary school students' media use at a specific point in time. Platform preferences, affordances, and public attention towards scientific topics change rapidly and may influence adolescents' familiarity, engagement, and attention to credibility cues. Therefore, future research should elucidate how adolescents' credibility assessment practices evolve over time and how repeated exposure to scientific content affects science-related trust.

These limitations require careful interpretation but also provide valuable insights for future research. Notwithstanding these limitations, the study offers actionable insights for science education practice. In particular,

the identified relevance of the trustworthiness perspective offers practical entry points for science media literacy educational interventions. At the same time, the study functions as a starting point for comparative and longitudinal research aimed at developing a more comprehensive understanding of how adolescents assess the credibility of scientific social media content.

Conclusions and Implications

This study examined how Austrian upper secondary school students assess the credibility of scientific content on Instagram. The focus was on both self-reported practices and actual assessment behaviour. It was found that most students can identify clearly credible or non-credible posts, but often have difficulty with content where the credibility cues are subtle or unknown to them. A perspective-based framework for assessing the credibility of scientific content on social media was derived, comprising four different credibility perspectives: design, trustworthiness, social validation, and content. These credibility perspectives summarise the different credibility assessment practices adolescents use to assess credibility. Adolescents apply these credibility perspectives based on the characteristics of the posts. The results also show a discrepancy between the students' self-reported credibility assessment practices and their observed behaviour. This suggests that the adolescents have limited awareness of the credibility cues they rely on when assessing credibility. It has been found that a focus on trustworthiness cues is most strongly associated with accurate credibility assessments, while relying on design or social validation cues sometimes leads to misclassifications. This underscores the need to guide students towards more analytical, reflective credibility assessment practices and to help them be aware of the credibility perspectives they are applying. From an educational perspective, these findings suggest that teaching strategies should utilise the perspective-based framework derived in this study to promote critical reflection and the systematic application of credibility assessment practices. For science communication, the results indicate that credibility cues must be clearly visible and interpretable to support accurate credibility assessment by adolescents. Overall, this study provides a transferable, perspective-based framework for assessing credibility in social media as well as evidence of gaps in students' awareness of the application of credibility cues and credibility assessment practices. Furthermore, the study offers a basis for future research and educational interventions aimed at strengthening critical media literacy in the digital age.

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Declaration of Interest

The authors declare no competing interest.

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