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RESEARCH ARTICLE



Trust and Journalistic Transparency Online

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ABSTRACT

Transparency has become a central norm in journalism and it is deemed to increase audiences' perceptions of credibility, legitimacy and trust in the news media. While a number of studies have sought to support these claims by primarily testing the effects of transparency on credibility perceptions, this research explores how audiences' trust in journalism is impacted by various features and types of transparency on the news item level. Two experiments were conducted. The findings of the first experiment suggest that transparency in its current form may not increase news consumers' trust. The second experiment explored possible explanations for the findings of the first study. The results of the second experiment indicate that while audiences value transparency in reporting, they struggle to recognize and recall the presence of transparency and transparency features within a news online article. Overall, the findings of the two studies suggest first, the need to reconceptualize how audiences perceive and process transparency information and second, to include transparency information as part of the news story.

KEYWORDS


Transparency; trust; journalism; institutionalism; credibility; accountability

Introduction

Transparency, as a norm and practice, continues to gain importance for the journalistic institution. Many journalism scholars and practitioners believe that transparency, i.e., providing more information to the public about the inner workings of journalism, will make journalism more accountable, credible and trustworthy (Deuze 2005; Allen 2008; Singer 2007; Plaisance 2007; Karlsson 2010, 2011; Lasorsa 2012; McBride and Rosenstiel 2014; Ward 2014; Vos and Craft 2017). In fact, news organizations have been increasing their transparency efforts, during the recent Fake News and Lyingpress attacks on the journalistic institution, with the hope to increase trust with their audiences (Spayd 2016; Koliska and Assmann 2021).

While the introduction of digital technologies has enabled greater transparency in journalism (Karlsson 2011), the institutionalization of transparency as a core journalistic value (McBride and Rosenstiel 2014; SPJ 2014; RTDNA 2015) has been fueled by an increasing demand for transparency in society over time (Craft and Heim 2009). Schudson (1978) outlined the gradual process of opening up of various sectors within US society, from government to corporations, which eventually also impacted the journalistic

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institution. This development coincided with a growing awareness that the longstanding norm of objectivity was unattainable, which led the Society of Professional Journalists (SPJ) to remove objectivity as a core ethic in 1996. Although objectivity remains important to many journalism practitioners (Hellmüller, Vos, and Poepsel 2013), transparency is increasingly being used to legitimize journalistic practice (Karlsson 2010). Ward (2014, 45) pointed out that journalists who reject objectivity, justify their professional legitimacy by claiming that they are at least “honest and transparent.”

Despite the belief in the power of transparency, several questions remain as to whether transparency will indeed increase trust among news consumers and allow for more accountability in journalism (Karlsson 2022). Most studies investigating the effects of transparency have focused on credibility perceptions – frequently finding no (Roberts 2007; Karlsson, Clerwall, and Nord 2014; Tandoc and Thomas 2017; Peacock, Masullo, and Stroud 2022; Henke, Holtrup, and Möhring 2022) or modest effects (Curry and Stroud 2021; Masullo et al. 2021). One published study from Germany examining the relationship between transparency and trust in journalism also found modest effects of transparency on trust (Meier and Reimer 2011) but within a news media environment, that in contrast to the US (Gallup 2020), enjoys much higher trust ratings (Jakobs et al. 2021). An examination of whether transparency may help to build trust within the US can offer insights about transparency effects in varying news media contexts. Moreover, the majority of published research testing transparency effects did not explicitly examine possible differences between transparency features that give access to information about the production or the producer of news. This distinction may be critical as these two transparency types can be understood as separate and interacting layers - the source and the message - of trust in journalism (see Otto and Köhler 2018; Strömbäck et al. 2020a). Thus, the present study experimentally explores how US news consumers’ trust in journalism is impacted by various degrees and types of journalistic transparency (production and producer) online but also whether news consumers pay attention to transparency features in the first place, which in turn can significantly impact audiences trust evaluations.

Findings of the first experiment – testing transparency effects on trust – indicate that transparency had little to no effects on news consumers’ trust perception, echoing the results of other experimental studies. The results of the second experiment provide a possible explanation for the lack of effects in the first experiment. Study participants appeared to pay little attention to the various transparency features as they struggled to recall prominently displayed transparency information. Overall, the findings of both studies suggest that journalistic transparency may need to be reconceptualized as a form of dormant information that will be useful once news consumers need or are affected by such information.

Literature

Defining Journalistic Transparency

Transparency in journalism has generally been defined as the various ways of opening up the production and decision-making processes (including the disclosure of errors and possible biases) or, more generally, the inner workings of newsrooms to outsiders (i.e., news audiences and other stakeholders) to hold journalism accountable (Deuze 2005; Ward 2014). This definition pertains to the three perspectives of transparency: ethic

(Plaisance 2007; Ward 2014), professional value (McBride and Rosenstiel 2014) and practice (Karlsson 2010; Karlsson and Clerwall 2018). While ethical and professional value perspectives inform how transparency is practiced, only the practice of transparency can be immediately perceived by audiences when consuming news.

The practice of transparency has been further defined as disclosure (revealing formerly hidden production and decision-making processes), participatory (audience participation in the production and distribution of news) and ambient (peripheral information delivered via hyperlinks and journalistic opinions) transparency (Karlsson 2010; 2020). Heikkilä et al. (2014) differentiate transparency as providing information about the producer (journalists, news organizations), production (internal newsroom process) and the responsiveness (communication with audiences via social media etc.). While all of these types of transparency are essentially variants of information disclosure, transparency information can be generally differentiated between production (information about production and decision making via hyperlinks, in-text explanations, corrections, explanatory reports etc.) and producer transparency (information about journalists and news organizations via reporter bios, photos, comments, social media access etc.) (Karlsson 2010; Heikkilä et al. 2014; Koliska and Chadha 2016).

Producer transparency was one of the first transparency practices in American journalism, emerging about 100 years ago when bylines became increasingly institutionalized (Schudson 1978). Bylines were seen as first indicators of subjectivization in journalism (Schudson 1978) and an increased public profile can inform audiences about possible biases or viewpoints a journalist might have (McBride and Rosenstiel 2014). As such producer transparency provides more information about the news source. Production transparency has also been part of journalism from early on. Newspapers for instance have published corrections since the seventeenth century and later also provided mission statements and explanations about their work (Silverman 2007). Production transparency thus offers extra information about the news message. In this study the focus is on transparency as the disclosure of information while differentiating between production and producer transparency. This is because news organizations practice both forms of transparency “ritualistically” (Karlsson 2010; Koliska and Chadha 2016) and the examination of production and producer transparency can also strengthen the external validity of this study.

Transparency Research in Journalism

Normative journalism research, such as professional and ethical literature, has primarily discussed transparency as an ethic and institutional value critical for enabling a democratic discourse (Allen 2008). Plaisance (2007) argued that transparency is central to the pursuit of truth in journalism and is a prerequisite of personal freedom because it enables people to decide autonomously. Several researchers suggested transparency will help audiences distinguish between opinions and facts, therefore increasing credibility and trust (McBride and Rosenstiel 2014; Singer 2007; Plaisance and Deppa 2009; Karlsson 2010). Weinberger (2009) posited that transparency is the “new objectivity” because now audiences would be able to see for themselves whether authors are objective or not. In contrast, only a few voices cautioned that transparency could undermine journalistic authority (Broersma 2013) or lead to information overload (Craft and Heim 2009).

Although much about how and to what extent transparency is practiced still remains unknown (Karlsson 2022), some inroads have been made. Empirical research has examined journalistic transparency on Twitter, showing that female journalists were more transparent than their male counterparts by revealing information about their jobs, personal lives and daily activities (Lasorsa 2012). Hellmüller, Vos, and Poepfel (2013) surveyed journalists investigating whether transparency surpassed objectivity as a core professional ethic and value. They found no conclusive evidence of a shifting journalistic cultural capital but showed that objectivity remained a strong norm among journalists. Several other studies indicated that journalists grappled with embracing transparency in their daily work within the US context (Plaisance and Deppa 2009; Chadha and Koliska 2015), in New Zealand (Rupar 2006) and also Germany (Koliska and Chadha 2018). Audiences may also struggle to fully accept and recognize transparency even though they view it as important to trust the news media (Karlsson 2020). Two studies from Sweden showed that audiences' attitudes and opinions about transparency were mixed because it either put into question participants' expectations of receiving accurate news (Karlsson, Clerwall, and Nord 2017) or because audiences did not recognize the utility of transparency (Karlsson and Clerwall 2018). Nevertheless, news organizations have and continue to institutionalize transparency (Vos and Craft 2017).

Testing Transparency

So far, only two studies in the US (Curry and Stroud 2021; Masullo et al. 2021) were able to find some modest transparency effects on news audiences' credibility perception and one study in Germany found modest effects on trust (Meier and Reimer 2011). All other studies examining the impact of transparency features on credibility perceptions could not find any effects (Tandoc and Thomas 2017; Karlsson, Clerwall, and Nord 2014; Roberts 2007; Peacock, Masullo, and Stroud 2022; Henke, Holtrup, and Möhring 2022).

Although much of the published research has examined credibility perceptions, these studies vary greatly in their methodological approaches. Research has tested transparency effects ranging from a single up to 31 variations of transparency. These studies tested either production (disclosed information about the message such as transparency box or story labels) (Roberts 2007; Meier and Reimer 2011; Peacock, Masullo, and Stroud 2022; Masullo et al. 2021) or producer transparency (disclosed information about the news source such as reporter bio or byline) (Tandoc and Thomas 2017) or both (Curry and Stroud 2021; Karlsson, Clerwall, and Nord 2014; Henke, Holtrup, and Möhring 2022). Yet, research testing both transparency types tested either a single production or producer transparency feature at a time (Karlsson, Clerwall, and Nord 2014; Henke, Holtrup, and Möhring 2022) or tested both transparency types at the same time (Curry and Stroud 2021) without parsing production and producer transparency.

News organizations use multiple production and producer transparency features online simultaneously and thus the examination whether audiences are impacted differently by producer or production transparency could be critical to better understand how these different features affect trust. Trust research in journalism indicates that the interaction of the various layers of trust, such as trust in the information or message and trust in the producer or source, can significantly impact overall trust development (Otto and Köhler 2018; Strömbäck et al. 2020b). In other words, there may be no trust in the production transparency information if one doesn't trust the producer transparency

information and vice versa. Moreover, although normative research has suggested that transparency will increase trust in journalism, very little is known about the transparency effects on trust in different contexts. So far only one published study has actually examined this claim in Germany across various transparency features (Meier and Reimer 2011). Thus, this study examines audiences' trust across differing levels of transparency including production and producer transparency and in the cultural news media context of the US.

Trust in Journalism

Trust "plays a part in almost every human interaction" (Tsfati and Cappella 2003, 505) and is a prerequisite for modern societies, where interactions with strangers cannot be avoided because the increasing complexity necessitates division of labor, which has aided the rise of professional experts (Simmel and In Wolff 1950). Journalists can be understood as such experts; they filter and select information to provide orientation for audiences within an increasingly complex world. Trust, then, is essential for journalism, as audiences must often rely on or put their belief in experts or the "professionalism of journalistic practice" (Liebes 2000, 295).

But trust in journalism is a somewhat tricky concept because it has frequently been associated with credibility. Self (2009) described research around credibility as "plentiful, contradictory, and confused" (435), as the term has been defined in various forms as believability, reliability, expertness, trustworthiness, and trust (Hovland, Janis, and Kelley 1953; Gaziano and McGrath 1986; Flanagin and Metzger 2000). Kohring and Matthes (2007) argued that this conceptual confusion started at the beginning of credibility research in modern communication, when Hovland, Janis, and Kelley (1953) examined persuasion and opinion change. Hovland and his colleagues suggested that expertise and trustworthiness are prerequisites of credibility. Several researchers criticized this approach (Kioussis 2001; Meier and Reimer 2011; Engelke, Hase, and Wintterlin 2019), arguing that "it remains unclear whether these two components ... are dimensions of credibility or reasons for credibility" (Kohring and Matthes 2007, 233). Although the concepts of trust and credibility are interlinked, Engelke, Hase, and Wintterlin (2019) argue that credibility only partially captures the notion of trust because credibility's focus is believability. Similarly, van Dalen (2020, p. 358) suggests "credibility only refers to the perceived truthfulness of information, while trust refers to the expectation that the media will satisfactorily fulfill several societal tasks, one of which is providing truthful information." Van Dalen further argues that for the news media to fulfill its watchdog role in society, it must have legitimacy, which is based on public trust.

The theoretical questions underlying the concept of credibility led Kohring and Matthes (2007) to develop a theoretical model for trust in journalism, which was empirically validated (Prochazka and Schweiger 2019). They argue that "[W]hen people put their trust in news media, they take a certain risk. This is because journalists selectively choose some information over other information. Therefore, when trusting news media, people trust in specific selections," which reflect the societal tasks journalists are expected to perform (Kohring and Matthes 2007, 239). Their trust-in-journalism model consists of four main elements: 1. trust in topic selectivity; 2. trust in fact selectivity; 3. trust in accuracy of descriptions, and 4. trust in journalistic assessment (Table 2). Trust in the selectivity of topics refers to the trust in journalism to select topics for public discussion. This element touches upon the frequency, continuity, and emphasis of a selected topic in

contrast to other important events. Trust in the selection of facts focuses on the inclusion of essential and comprehensive background information and also includes different points of views. Trust in the accuracy of depictions serves to empirically verify the factual information that has been selected for a given news story. Finally, trust in journalistic assessment evaluates journalistic commentary as a value-based form of journalism by assessing the comprehensibility, usefulness, and appropriateness of comments. For each trust category Kohring and Matthes (2007) developed 16 individual trust items. For this study, these individual trust items were adapted into a single dimension of trust and serve as the main measure to explore the impact of transparency on trust in journalism.

Connecting Transparency to Trust in Journalism

Lewis and Weigert (1985) refer to Simmel and In Wolff (1950) who suggested, “trust involves a degree of cognitive familiarity with the object of trust that is somewhere between total knowledge and total ignorance” (Lewis and Weigert 1985, 970). Kohring and Matthes (2007) described this state as midway between knowing and not knowing, which always leaves an amount of uncertainty. In contrast, total knowledge does not require trust (Simmel and In Wolff 1950). Trust, then, is closely linked to knowledge or access to information about another social actor (individual, group, institution), object or process, which in the case of journalism is frequently provided via producer and production transparency. “The manifestation of trust on the cognitive level of experience is reached when social actors no longer need or want any further evidence or rational reasons for their confidence in the objects of trust” (Lewis and Weigert 1985, 970). Lewis and Weigert argue when no additional evidence is required people will take a “cognitive leap,” which enables trust to develop. Taking the leap indicates a tipping point or knowledge saturation that may lead to trust. Others have described this moment as risk taking or vulnerability (Coleman 1990) because of the uncertainty stemming from the gap of knowing and not knowing (Yamagishi, Cook, and Watabe 1998). In the journalistic context, where trust is placed in the professionalism of a social actor (Kohring and Matthes 2007), transparency provides information about the journalistic work process, which reduces the knowledge gap or information asymmetry between the audience and news organizations (Karlsson 2022). But providing transparency can also be seen as a heuristic for professional journalistic performance (Sundar 2008; Karlsson 2020), reflecting “the competence and integrity of the professional” (Lewis and Weigert 1985, 981). In sum, providing transparency information about the journalistic work process can be understood as a cognitive cue that indicates the expected societal journalistic performance, which in turn may increase trust.

Processing Transparency Information

Although transparency offers access to more information about the production and producer of news, this information is frequently at the margins of an article and not embedded within a news story (Koliska and Chadha 2016). This placement of transparency information at the fringes of a news article can suggest to a reader that this information may be less important (Masullo et al. 2021) and this may lead the reader to employ cognitive heuristics (relying on previous knowledge, rules and mental shortcuts) – instead of systematic processing, which requires a much greater mental effort and is employed when information is considered vital to an individual

(Chaiken 1980) – to evaluate and validate additional information about the production and producer.

Research has shown that people frequently rely on cognitive heuristics such as news sources or the news medium to evaluate the credibility of a news organization (Metzger and Flanagin 2013). Sundar (2008) suggested that specifically online news users will draw on various technological affordances of a webpage to heuristically assess the trustworthiness of media content. His modality, agency, interactivity and navigability (MAIN) model would then predict that technologically enabled transparency features such as hyperlinks, transparency boxes, author bios etc. will serve as cues for people to heuristically evaluate the symbolic representation of journalistic performance as transparent and thus as trustworthy. Transparency features may then function as a cognitive heuristic that signal expected journalistic performance and trigger “information saturation,” which is necessary to take a leap of faith. Increasing transparency information (about the producer or production) should then also increase the likelihood of taking a cognitive leap and the probability of trust to occur. Thus, the following hypothesis is proposed:

H1: A a) production transparency news item and a b) producer transparency news item will be trusted more than a non-transparent item.

Online news articles more often than not feature various elements of both producer and production transparency, which, together, in this study, are described as full transparency. An average news user is most likely familiar with the design of an online news article webpage that will include many if not all transparency features. As such full transparency should serve as a more familiar cognitive heuristic reflecting expected journalistic performance. Similarly, Lewis and Weigert (1985) suggest that a certain cognitive familiarity is needed for trust to occur. Thus, providing not only more information (full transparency) but also via a common or expected news article webpage design should lead to more trust than an article that includes fewer transparency cues.

H2: A full transparency (both production and producer transparency) news item will be trusted more than a) a non-transparent article, b) a production transparency article, and c) a producer transparency article.

The type of information being disclosed may also affect trust perceptions. Specifically, disclosing information about a journalist who describes his or her convictions as possibly biased toward the news content may negatively affect the trust evaluation of the news item because such information violates widely expected professional journalistic performance of independence and neutrality. Transparency that undermines these values and thus the professional integrity of journalists could consequently trigger negative trust assessments (Karlsson, Clerwall, and Nord 2014).

H3a: A full transparency news item will be trusted more than a full transparent article that includes biased information about the producer.

H3b: A producer transparency news item with neutral personal information will be trusted more than a producer transparency article with biased information.

Methodology: Study 1

Experiment Design

In order to gauge transparency effects on trust, a web-based experiment (approved by the Institutional Review Board), was employed. A between-subjects design was used with respondents being randomly assigned by an algorithm to the various treatments. The experiment measured transparency effects on trust (six conditions) (Table 1; Figure 1 & 2 in Appendix).

Sample

Participants were recruited on Amazon's Mechanical Turk (MTurk); a crowdsourcing online labor platform, which compensates discrete tasks with micro payments starting

Table 1. Transparency features (full, production and producer transparency).

Transparency version	Transparency Features	Experiment #1 trust n = 1021	Experiment #2 transparency n = 304
1. No-transparency	Text <ul style="list-style-type: none"> no transparency features 	n = 166	n = 58
2. Production transparency	Text and included: <ul style="list-style-type: none"> hyperlinks to original documents corrections plus explanations editorial information comments time stamps, updates call for audience participation 	n = 178	n = 62
3. Producer transparency	Text and included: <ul style="list-style-type: none"> byline email contact of journalist social media contacts of journalist photo of journalist bio of journalist 	n = 166	n = 64
4. Full transparency	Text and included: <ul style="list-style-type: none"> all elements of production transparency (ver. 2) all elements of producer transparency (ver. 3) 	n = 168	n = 60
5. Full transparency (biased producer image)	Like version 4 but included: <ul style="list-style-type: none"> biased producer information (ver. 4) 	n = 170	n = 60
6. Producer transparency (biased)	Like version 3 but included: <ul style="list-style-type: none"> biased producer information and included political affiliation 	n = 173	

at \$0.01. On MTurk requesters post jobs and workers choose paid jobs or HITs (Human Intelligence Tasks) they want to do on the closed platform. In the recent past, MTurk has been increasingly used for research studies and the platform's validity for research has been demonstrated (Mason and Suri 2012). Each participant was offered \$0.75 to take part in the study in May of 2015. The average speed of completing the task was 17 min ($M = 17$; $SD = 8.3$). Only participants that demonstrated a track record of 98% satisfactory task completion over the past 1,000 tasks were able to participate in this study.

A total of 1,092 participants took part in the first experiment. After removing all participants who did not complete all parts of the experiment (44) and further cleaning the data from irregular or possibly automatically generated responses (27)¹, 1,021 participants (56% men, 44% women; mean age 37) remained. 77% of the participants were between 18–44 years old with the largest group (40%) in the 25–34-year category. 83% of the participants had at least some college education with the majority (42%) having obtained a bachelor degree and 11% a graduate degree. Most participants were white (77%), while Asians, African Americans and Hispanics made up each 7% of the sample, 2% identified as other.

Procedure

Participants on MTurk were invited to take part in an academic study about quality in journalism. The task description informed participants that they should first read a news article and then fill out a questionnaire. Once participants accepted the HIT, they had access to the URL that directed them to the news article webpage. An algorithm randomly assigned participants to one of the six webpage versions (Table 1). Before participants could read the article, another set of instructions was displayed, stressing the importance of carefully reading the article and evaluating the webpage content in the subsequent Qualtrics questionnaire. Once participants proceeded to the questionnaire they could not return to the webpage.

Stimuli

A news story, addressing the potentially harmful effects of nanoparticles in everyday life, was used across all experiment conditions. Following Meier and Reimer's (2011) suggestion, the story was selected to provide a widely relevant topic for audiences that, at the same time, would be relatively unknown to most, in order to avoid possible partisan opinions. Opinions regarding nanotechnology range from extremely dangerous, causing diseases if nanoparticles enter human bodies, to absolutely harmless. The 500-word article was edited by a professional journalist to include this range of opinions and to balance these viewpoints. The article was placed on a website that was designed and programmed for this study. A generic news website layout was chosen to avoid possible trust effects triggered by a particular brand. The article was embedded into six different webpages that looked identical with respect to the general website and text layout, but differed in presence of transparency features (Appendix: Figures 1&2).

Measures

For this study Kohring and Matthes (2007) trust scale has been adapted into a single trust dimension.² As audiences were presented only one topic and they may not be able to speak about how nanotechnology has been covered overall, all the items belonging to the trust in the selectivity of topics category had been removed. Meier and Reimer (2011) also excluded these items. One additional item from the journalistic assessments category (The journalists' opinions are well-founded.) was also excluded because the article didn't include any discernable journalistic opinions, leaving 11 (Table 2) of the initial 16 individual trust items as theorized by Kohring and Matthes (2007). After participants were exposed to the different stimuli (Table 1), they were asked to rate — on a scale from 1 (strongly disagree) to 5 (strongly agree) — to what degree they concur with the statements listed in Table 2 below. The statements were randomized for each participant to avoid order effects. Participants were also asked to rate to what degree (five-point Likert scale) they trusted the author (journalist) and the news media and how often they consume news (8-point rating scale from never to several times a day). Finally, demographic information about each participant was collected including age, education, occupation, gender, etc.

Findings: Study 1

Each of the 11 trust items were compared as one dimension of trust as a group and individually across two conditions to analyze the strength and direction between transparency levels (IVs) and trust (DVs) (Table 2). The group and single item pairwise comparison is helpful because Kohring and Matthes (2007) trust model didn't have a good fit. A one-way ANOVA was conducted to compare overall levels of trust, as measured by the factor score of a one-factor EFA across all six conditions. No significant differences were returned ($M_1 = -.04$, $SD = .93$, $M_2 = -.03$, $SD = .95$, $M_3 = .06$, $SD = .90$, $M_4 = .06$, $SD = .86$, $M_5 = -.11$, $SD = 1.03$, $M_6 = .06$, $SD = .92$, $F(5,1020) = .996$, $p = .419$).

A Spearman's rank-order correlation was employed to compare each item individually across two conditions because both variables (DVs and IVs) are considered ordinal rather than interval and the relationship between the two variables is monotonic (i.e., as transparency increases, trust should increase). Transparency conditions five and six (biased producer information) were excluded from the Spearman correlations, as they cannot be considered monotonic. Spearman correlations (r_s) were run across the varied levels of transparency (transparency versions: 1&2, 1&3, 1&4, 2&4, 3&4) to tease out possible differences on each of the eleven trust items (Table 2; Supplemental material). Hypotheses H1(a and b) and H2 (a, b and c) were rejected as no significant results could be found. Only one single item (5. The information in the article would be verifiable if examined) tested in hypothesis H2a (which explored whether a full transparency article will be trusted more than a non-transparent one), showed a weak yet significant correlation. Transparency did impact participants' trust evaluations with respect to the information in the article being verifiable if examined ($r_s = .153$, $p < .05$). Nevertheless, because only one of the 11 trust items was significant and the correlation was rather weak, H2a was rejected. Hypothesis 3 suggested that biased information about the journalist (producer transparency) will negatively influence participants' trust assessment about a news item.

Table 2. First Study: Adjusted model of trust in journalism (Kohring and Matthes 2007) including trust as single dimension and Cronbach's alpha; trust rating means for item-by-item trust measure, with standard deviations, across six levels of transparency (Five-point Likert scale).

Cronbach α = .78 Total variance = 61.25%		All 6 Transparency levels. n = 1021		No Transparency n = 166		Production Transparency n = 178		Producer Transparency n = 166		Full Transparency n = 168		Full Transparency biased – n = 170		Producer Transparency biased n = 173	
		Trust Factor loadings		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Trust single item comparison															
1. The essential points are included	.604			3.86	.76	3.80	.80	3.77	.77	3.78	.80	3.71	.78	3.86	.74
2. All important information regarding the topic is provided	.490			2.98	.99	3.01	1.09	3.17	1.04	3.04	1.08	2.97	1.07	3.16	1.14
3. The reporting of the article includes different points of view	.179			3.51	.98	3.54	.95	3.41	1.04	3.57	1.02	3.46	1.06	3.77	.97
4. The focus of the article is on important facts.	.553			3.76	.89	3.69	.77	3.77	.89	3.80	.73	3.61	.89	3.70	.88
5. The information in the article would be verifiable if examined.	.612			3.64	.76	3.75	.73	3.70	.75	3.77	.71	3.66	.86	3.72	.71
6. The reporter information is true.	.666			3.46	.62	3.52	.72	3.57	.65	3.51	.64	3.44	.71	3.51	.67
7. The facts I received are correct.	.662			3.47	.69	3.49	.62	3.49	.62	3.41	.67	3.39	.72	3.53	.71
8. I think the article recounts the facts truthfully	.768			3.75	.76	3.66	.78	3.78	.76	3.80	.66	3.71	.84	3.76	.69
9. When criticism is expressed, it is done in an adequate and well-founded manner.	.461			3.72	.70	3.78	.74	3.79	.74	3.89	.63	3.69	.81	3.77	.74
10. The journalist's assessments regarding the topic are useful.	.590			3.87	.82	3.78	.82	3.90	.83	3.88	.64	3.83	.82	3.95	.79
11. The journalist's evaluations of the topic are well founded.	.692			3.53	.75	3.64	.78	3.69	.77	3.74	.71	3.61	.77	3.66	.75

Note: No significant differences were found across all levels of transparency comparisons. Extraction method: Principal component analysis. Rotation method: Promax with Kaiser normalization. The factor analysis passed Bartlett's test of sphericity $\chi^2 (55) = 3567.337, p < .0001$ and Kaiser–Meyer–Olkin Measure of Sampling Adequacy (.892)

The hypotheses were tested using regression analysis. Both H3a ($p = .97$) and H3b ($p = .12$) were rejected. Despite the fact that all hypotheses were rejected, participants ($n = 1021$) expressed on average that they sometimes trusted the news media ($M = 2.99$; $SD = .69$) and agreed that the journalist responsible for the story is trustworthy ($M = 3.85$; $SD = .78$).

Discussion: Study 1

Transparency appears, at least in this study, not to be impacting trust in journalism, since all hypotheses were rejected. No notable differences were found between any of the transparency levels including production and producer transparency. Kohring and Matthes (2007) concept of trust in journalism is built on sociological theories of trust, which suggest that increasing the amount of knowledge would decrease uncertainty and increase the likelihood of taking a “leap of faith” in order for trust to occur (Lewis and Weigert 1985). Kohring and Matthes (2007) trust model returned significant results when Meier and Reimer (2011) used it in Germany. As the first experiment was modeled in many aspects after Meier and Reimer’s study, the lack of significant effects of transparency on trust among U.S. study participants may be explained by cultural differences. News consumers in Germany and the United States might differ in recognizing, decoding, or processing the varied transparency information. News audiences in Germany are also known to be more trusting in journalism than in the US (Jakobs et al. 2021; Gallup 2020). Karlsson, Clerwall, and Nord (2017) showed, in the Swedish news context, that preexisting trust in journalism can positively influence transparency perception of news. Similarly, in this study preexisting trust in the news media also positively influenced trust evaluations.

Overall, this study suggests that participants did not recognize the various transparency features as cognitive heuristics of expected journalistic performance. Moreover, participants possibly didn’t interact very much with the transparency features as Curry and Stroud (2021) have previously suggested or participants didn’t pick up on the intended meaning of transparency features i.e., being more open and honest about how journalism is being done and who the people are behind the process. This may also explain the lack of results regarding negative or biased transparency information about the journalist. Although Karlsson, Clerwall, and Nord (2014) were able to find some results concerning biased information about the journalists, this experiment was not able to show such effects.

The lack of significant findings in the first experiment raised a number of questions. Considering that other experiments could either not find transparency effects (Roberts 2007; Karlsson, Clerwall, and Nord 2014; Peacock, Masullo, and Stroud 2022; Henke, Holtrup, and Möhring 2022) or found only moderate correlations (Meier and Reimer 2011; Curry and Stroud 2021; Masullo et al. 2021) or showed that participants barely engaged with interactive transparency features (Curry and Stroud 2021), it is reasonable to assume that audiences may not pay attention to or pick up on the function of transparency features, which is to show audiences the journalistic process. Thus, an additional experiment was conducted to explore whether news audiences online are able to recognize and recall transparency features in the first place. The underlying rationale was that if audiences do not pay attention to transparency features or their intended function, they

may not evaluate transparent news stories any differently than a non-transparent news article. The experiment was guided by the following research question:

RQ: How do features like hyperlinks, editorial comments, journalist's bio etc. affect reader's perceptions of journalistic transparency?

Methodology Study 2

Experiment Design and Procedure

The second online experiment (approved by the Institutional Review Board) followed a similar design and procedure as the first. After participants accepted the HIT on MTurk, they were randomly assigned to one of five webpages with varying levels of transparency (Table 1). After accessing the webpage and reading the article (see Appendix Figures 1–2) participants were instructed to respond to a questionnaire via link at the bottom of each page. In the second experiment, condition six – biased producer transparency, which included biased information about the author – was dropped because condition five (full transparency) included the same information. The full transparency condition (including production and producer transparency features) also more accurately resembles how news organizations generally practice transparency.

Sample

Participants were recruited via MTurk using the same criteria for selection as in the first experiment. No one who participated in the first experiment was able to take part in this second study because their MTurk identification numbers were blocked for this HIT. A total of 379 participants were initially recruited two weeks after the first experiment but after removing all participants who did not complete the experiment, 304 participants (58% men, 41% women, 1% other; mean age 37) remained. Most participants were between 18–44 years old (78%) with the largest group within the 18–25 years category (41%). 86% of the participants had at least some college education with the majority (41%) having obtained a bachelor degree and 19% a graduate degree. Participants were mainly white (76%), followed by 9% of African Americans and Asians respectively. Hispanics made up 5% of the sample, while 1% identified as other.

Stimuli

Participants were asked to read the same news article about nanoparticles and their potential harmful effects as in the first experiment, placed on five webpages with various levels of transparency (Table 1).

Measures

The second experiment posttest questionnaire asked participants to recall the presence of different transparency features (such as the presence of hyperlinks, author bio, editorial explanations etc.) and also to recall specific information from the article and the transparency features (such as image used on top of the article, image of the author, information

Table 3. Assessing importance of transparency among news audiences (n = 304).

Survey questions (5-point Likert scale; 5= very trustworthy/important)	<i>M</i>	<i>SD</i>	Percentage of participants selecting 4 & 5
How important is it to you that a news article is transparent about its methods, sources, possible mistakes, and biases?	4.24	.69	90%
How trustworthy are news articles that explain all processes and decisions that went into the production of a story?	4.03	.82	78%
How trustworthy is an article if you see the biography and photo of the journalist?	3.4	.87	43%
How trustworthy are news stories that show mistakes and explain corrections made by journalists?	4.03	.81	79%
To what extent do you agree with the following statement: "I trust a news story that is transparent more than one that is not transparent." (*A transparent story explains all production and decision processes including mistakes and sometimes possible biases)?	4.35	.75	91%

about the author etc.). To identify the presence of transparency features participants could select from the entire list of possible features, whereas they were given multiple choice options to correctly identify specific information from the article and the transparency features. Participants were also asked to evaluate to what extent the article they saw was transparent. Right below the question the following definition was provided: "Transparent is defined as being open regarding journalistic sources, methods and decisions as well as possible biases and intentions." Participants were then asked to rate the article on a five-point Likert scale (1 - not transparent to 5 – very transparent). The definition was provided because the concept of journalistic transparency may not be widely known beyond journalist practitioners and scholars. The findings of the first experiment suggests that audiences may not consider transparency as part of the expected professional journalistic performance (Karlsson 2020; van Dalen, 2020). Thus, the second questionnaire included a set of questions assessing (using five-point Likert scale) the importance of journalistic transparency (Table 3). All but the demographic questions were randomized.

Findings

A one-way ANOVA was conducted to compare participants' evaluation of transparency across the five conditions. The test did not show any significant effect on participants' transparency evaluations ($M = 3.72$; $SD = .86$; $F(4, 299) = 2.33$, $p = .056$). A post-hoc test was conducted to compare the different transparency conditions pair by pair. Post hoc comparisons using Tukey HSD test indicated that participants' transparency evaluations significantly differed only between the non-transparent ($n = 58$, $M = 3.47$, $SD = .92$) and full transparent ($n = 60$, $M = 3.92$, $SD = .72$) conditions ($p < .036$); all other pair wise comparisons (producer transparency $n = 64$, $M = 3.76$, $SD = .81$; production transparency $n = 62$, $M = 3.79$, $SD = .91$; full transparency including biased producer information $n = 60$, $M = 3.65$, $SD = .90$) did not significantly differ.

Participants' recall of transparency features across the five conditions (Table 1) varied at times quite strongly. While 84% of the participants who were randomly assigned to a condition that included a photo of the journalist recalled having seen a photograph, only 34% were able to correctly identify the actual journalist depicted on the website. The image and author bio were visible all the time. Even as the reader of the article scrolled down, the author information moved along on the side. Moreover, 53% of the study participants,

who were randomly assigned to a condition with an editorial explanation, recalled seeing it. Yet, only 26% of the participants assigned to these conditions recalled a detail from the editorial explanation in the margins (the number of articles the journalist wrote). This number (50) was prominently displayed and continuously visible to the participants (similar to the author information) without the need to click on or read the entire editorial text. Conversely, more participants, 74%, were able to recall a detail from the text that referred to a number (6000) of research articles that have been written on the subject of nanotechnology. Participants also struggled overall to recall the presence of the individual transparency features, which they were individually exposed to. Half of the participants correctly identified that they did not encounter any transparency features (non-transparent condition, $n = 58$) while only 35% of the participants in the producer transparency condition ($n = 64$) correctly recognized the presence of author and contact information. The recall was slightly better in the production ($n = 62$) and full transparency ($n = 60$) condition where 56% and 57% of participants were able to identify the presence of various transparency features in their respective conditions. Notably, the highest correct recall of 65% was in the full transparency condition with biased producer transparency information.

While study participants did not seem to fully notice the various transparency features and information, they did, however, express that transparency in journalism is a value they care about (Table 3). In fact, 90% of the 304 participants in the second experiment reported that a news article that is transparent about its methods, sources, possible mistakes, and biases is very or extremely important to them ($M = 4.24$; $SD = .69$, on 5-point Likert scale). This finding echoes Karlsson's (2020), who showed that news audiences expect and value transparency as a marker of journalistic quality.

Discussion Study 2

The second experiment provides some tentative explanations for the non-significant results of the first experiment and may also inform the findings of other research that did not find any transparency effects. That participants could only partially recall transparency information that was placed on the margins of the news text; this could indicate that information about the journalistic process may not be adequately processed when such transparency information is not part of the story and only accessible on the periphery via "digitally outsourced" transparency features (Koliska and Chadha 2016). After all, participants were more accurate in recalling information from the actual news text than from an explanatory text on the side of the webpage. At the same it is possible that participants didn't pay much attention to transparency information because they failed to recognize the utility of this information and the intended meaning of the transparency features as a gesture or cue of being open and truthful about the journalistic process (Plaisance 2007). That participants value and expect transparency but struggled to perceive the presence of transparency features could be seen as an indicator that audiences find it difficult to make sense of the various transparency features.

General Discussion and Conclusion

Participants' trust perceptions in the US, as tested in the first experiment, did not seem to be affected by any of the transparency features or transparency types (producer and

production) they encountered across six different transparency conditions. Overall, the findings of the first study, similar to other research testing transparency, suggest that transparency features in journalism (at least in their current form) may not be as impactful as the professional and ethical journalistic literature suggested. But there is the possibility that cultural differences could have impacted the perception of transparency features on trust, since Meier and Reimer (2011) were able to find some effects in Germany. More recently Prochazka and Obermaier (2022) suggested that transparent journalistic reactions to media critical online comments may positively increase brand quality perceptions and thus media trust in Germany.

It is also possible that the limitations of experimental design have affected the findings. The research literature on trust indicates that the number of interactions between two exchange partners can be crucial for establishing trust relationships (Kollock 1994). The experiment in this study only tested a one-shot interaction, which may have prevented the formation of trust among the participants in this study. The use of MTurk to recruit participants for both studies may also have impacted the results. While much of the literature suggests that study participants from MTurk can form a representative sample of the US population yielding viable results (Mason and Suri 2012), some have cautioned that participants could at times be inattentive (Cheung et al. 2017).

The second experiment empirically explored possible explanations of why news consumers may not perceive any differences between non-transparent and transparent news articles. The findings suggest that news consumers, while expecting and valuing transparency, seem to pay only partial attention to transparency information. As information is frequently “digitally outsourced” (Koliska and Chadha 2016) i.e., on the margins of a news article, transparency information may be seen as less significant. Participants were in fact much better at recalling information from the news article than from the transparency information on the margin. This suggests that current transparency features may not be ideal to provide transparency information to audiences. Instead embedding transparency information into the news story itself, as independent fact checkers frequently do (IFCN n.d.), could be more effective. Peacock, Masullo, and Stroud (2022) showed that news labels (which provide transparency), which were part of the story, were more effective than when they were placed above an article.

Some researchers have cautioned that including transparency information could be seen as simply adding “noise” (Craft and Heim 2009). Audiences may manage the extra transparency information, as theorized in this study, by processing it heuristically (Chaiken 1980; Sundar 2008). As heuristic information processing is based on recognizable schemas that provide shortcuts for meaning making (Chaiken 1980), it is possible that news consumers do not recognize the indented utility of transparency features as a gesture of openness and professional journalism. In this case the provided information may not be helpful to increase trust or credibility. Participants in the second study were able to recall, on average, half of the present transparency features. But this recall of information cannot account for the recognition and appreciation of transparency. Even when a definition of transparency was provided participants were only slightly able to gauge the differences between a non-transparent and a fully transparent news item. These findings suggest that transparency should be part of media literacy training in schools and universities. But news organizations should also educate audiences more about their transparency efforts.

At this point, it remains unclear how exactly the link between transparency and audiences' trust is established. Simply providing additional information may not be enough to instill trust. An important question that remains to be answered in this process is whether news consumers recognize transparency features as markers of journalistic quality (Karls-son 2011; 2020). In order to answer this question, transparency may need to be reconceptualized, possibly as a dormant factor that comes into play only when a problem occurs. News consumers may normally have little use for the transparency information but should they encounter something inexplicable in a story, possibly causing cognitive dissonance, transparency information could be helpful to explain possible discrepancies to resolve the problem. In such a scenario, audiences may indeed seek out or be affected by additional transparency information and when they can easily find it, it may lead to an increase of trust.

Notes

1. An attention-check asked participants about the topic of the article. All responses that failed this check or took less than 6 or more than 45 min to complete the experiment were deleted. The lower cut off time was set to ensure that participants would not skip reading the entire article and took enough time to answer all questions with some deliberation. The higher cut off time was set to ensure participants completed the task in one single session, limiting possible distractions from the task at hand. Previous research has suggested that MTurk participants can at times be inattentive (Cheung et al. 2017).
2. Kohring and Matthes (2007) trust model is originally comprised out of four main subfactors but principal components analysis (PCA) and exploratory factor analysis (EFA) showed that the 11 trust items used in this study did not separate clearly into the factors theorized by Kohring and Matthes (2007). The scree plot of principal component eigenvalues against component numbers demonstrated that the first component captured markedly the majority of the variance, indicating that a single measure of overall trust has a plausible substantive interpretation. Cronbach's alpha for the 11-item scale was deemed satisfactory at .78) (Table 2; Supplemental material).

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The Devil is in the Smallest Details



Nanoparticles of copper zinc tin sulfide create a solar cell. This entire layer of particles is only half as thick as the average human hair.

Nanotechnology is getting researchers closer to designing and engineering materials atom by atom. Materials as small as your DNA already revolutionize the production of drugs, cosmetics, cars, the treatment of cancer, or the decontamination of water.

This is just the beginning. The technology of this trillion dollar industry can be found anywhere from cottage cheese to computer chips. Chances are that the device you're reading this on does what it does because of nanotechnology. Batteries, digital memory and display screens all perform better because they use engineered nanoscale materials.

But the extremely small size makes nanotechnology controversial. Research shows that the invisible particles can cause harm if they get into your body or out into the environment.

"We do not know how many products there are on the market that contain nano-particles," said Wolfgang Dubbert, a scientist with Germany's Federal Environment Agency. "Consumers worldwide can't avoid the particles because, apart from sunscreen, products are not labeled as containing nano-particles."

The FDA recently issued new but nonbinding recommendations regarding the safe use of nanotechnology and labeling of products containing nanoparticles. The agency cautions manufacturers to test all foods carefully that contain nano-sized particles. Yet, how this is done, is mainly up to the manufacturer. The food industry got special attention for active food packaging labels that use nanoparticles to indicate the presence of contaminants or spoilage.

For more than a decade now, there has been a massive global investment in research into the health and environmental impact of engineered nanomaterials. More than 6,000 academic papers have examined the possible negative effects of nanoscale materials and how these may be averted.



A recent article in American Journal of Industrial Medicine found that a chemist developed symptoms that included throat irritation, nasal congestion, facial flushing and a runny nose after working with a powder consisting of nanometer-sized nickel particles. According to the authors of the report, this is "case one in our modern economy" of exposure to a nanotechnology product causing an individual to become ill.

But, Susanna Priest, a professor of risk communication at the University of Nevada Las Vegas, said, "the jury is still out. Previous studies did not provide clear evidence that nanotechnology triggers diseases." Andrew Maynard, a leading health risk expert at the University of Michigan, agrees. "The latest study concerning the use of nickel nanoparticles (above) does not show that nanomaterials are detrimental to our health but that the incident was more a case of bad exposure management."

The Centers for Disease Control and Prevention estimates that 10 to 20 percent of Americans are allergic to nickel, and inhaling nickel particles can increase this allergic reaction. Maynard said: "It shouldn't come as a surprise that handling nickel nanopowder in an open lab without exposure controls is not a great idea." Priest, the UNLV professor added: "What remains is a sense of uncertainty paired with a let's wait and see attitude among consumers. There are only a few among us who really want to be the one yelling Fire!"

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Figure 1. No Transparency.

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The Devil is in the Smallest Details

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By Owen Gibson



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Owen Gibson is chief technology correspondent. From 2007 to 2013 he was social media editor, covering the rise of emerging digital technologies. Prior to that he was The Washington Post's science correspondent. Gibson received a Master's degree in Journalism from Columbia University in New York and Bachelor's degree in Biomedical Engineering from Bucknell University. He is married and has two daughters.

Backstory - How and why we did "The Devil is in the Smallest Details"

We decided to put a veteran reporter on this story, who is our expert on nanotechnology. The reporter has covered the topic for several years and written over 30 articles about...

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Nanoparticles of copper zinc tin sulfide create a solar cell. This entire layer of particles is only half as thick as the average human hair. (Oregon State University)

Nanotechnology is getting researchers closer to designing and engineering materials atom by atom. Materials as small as your DNA already revolutionize the production of drugs, cosmetics, cars, the treatment of cancer, or the decontamination of water.

This is just the beginning. The technology of this trillion dollar industry can be found anywhere from cottage cheese to computer chips. Chances are that the device you're reading this on does what it does because of nanotechnology. Batteries, digital memory and display screens all perform better because they use engineered nanoscale materials.

But the extremely small size makes nanotechnology controversial. Research shows that the invisible particles can cause harm if they get into your body or out into the environment.

"We do not know how many products there are on the market that contain nano-particles," said Wolfgang Dabbert, a scientist with Germany's Federal Environment Agency. "Consumers worldwide can't avoid the particles because, apart from sunscreen, products are not labeled as containing nano-particles."

The FDA recently issued new but misleading recommendations regarding the safe use of nanotechnology and labeling of products containing nanoparticles. The agency cautions manufacturers to test all foods carefully that contain nano-sized particles. Yet, how this is done, is mainly up to the manufacturer. The food industry got special attention for active food packaging labels that use nanoparticles to indicate the presence of contaminants or spoilage.

For more than a decade now, there has been a massive global investment in research into the health and environmental impact of engineered nanomaterials. More than 6,000 academic papers have examined the possible negative effects of nanoscale materials and how these may be avoided.

A recent article in *American Journal of Industrial Medicine* found that a chemist developed symptoms that included throat irritation, nasal congestion, facial flushing and skin reactions after working with a powder consisting of nanometer-sized nickel particles. According to the authors of the report, this is "case one in our modern economy" of exposure to a nanotechnology product causing an individual to become ill.

But, Steven Priest, a professor of risk communication at the University of Nevada Las Vegas, said, "the jury is still out. Previous studies did not provide clear evidence that nanotechnology triggers diseases." Andrew Maynard, a leading health risk expert at the University of Michigan, agrees. "The latest study concerning the use of nickel nanoparticles (above) does not show that nanomaterials are detrimental to our health but that the incident was more a case of bad exposure management."

The Centers for Disease Control and Prevention estimates that 10 to 20 percent of Americans are allergic to nickel, and inhaling nickel particles can increase this allergic reaction. Maynard said, "It shouldn't come as a surprise that handling nickel nanopowder in an open lab without exposure controls is not a great idea." Priest, the UNLV professor added, "What remains is a sense of uncertainty paired with a let's wait and see attitude among consumers. There are only a few among us who really want to be the one yelling Fire!"

Correction History

05/15 6:17 p.m.

In a previous version of the article we identified Wolfgang Dabbert as a spokesperson with Germany's Federal Environment Agency but he is in fact a scientist with the agency.

05/15 6:30 p.m.

An earlier version of this article contained a wrong link to an original document of the Center for Disease Control and Prevention. The new link leads to the correct document, which indicates that 10-20 percent of Americans are susceptible to nickel allergies.

Reader collaboration wanted: Please Email us at treporter@news-flush-news.com if you have any suggestions or information that can help us to make this story better.

Open for comments. Sign in or create an account to join the discussion.

Mark Lebow - Milwaukee, WI

5 minutes ago

The future of tomorrow is here but are we really safe as this article claims? If all and everything will have nanoparticles won't there be more stuff our bodies and environment will have to handle?

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Chloe Leland, NH

27 minutes ago

My uncle's was in receiving cancer treatment through nanotechnology. So far I can only say good things about it. Other than normal chemotherapy nanotechnology can zero in on the cancer and not kill the human body as chemo does.

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Howard G. - New York

29 minutes ago

If these engineered nanoparticles are so small that they can get anywhere how can one even be sure until it may be too late?

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Vada, DC

30 minutes ago

6000 journal articles all wondering if nanotech can be unhealthy - wow! Feels a bit like there must be something to it. Shouldn't there be more transparent labeling?

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David Devault - Davis City, IA

30 minutes ago

Isn't that all a good thing? Materials designed on the atom level if you can get mix this with 3D printers we can most create everything that we want! Sci-Fi is becoming reality.

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Tom - Pittsburgh, PA

34 minutes ago

There is much to be said about the advantages of nanotechnology and hysteria won't help making sound decisions. I comment this down to earth approach of talking about the dangers of technology that does not let change we love. Good Journalism!

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Mike - San Diego

34 minutes ago

Last year I got sunscreen that used nanoparticles. It definitely lasted longer even after swimming. Wonder what happens if this stuff gets into the sea and then into fish and they eat it? Love seafood! But so unwanted extra!!!

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BaW - Ann Arbor, Michigan

51 minutes ago

I find it rather disconcerting that this article does not examine the real problems of nanotechnology as a group. It reports that there is certainly more than enough data that questions the safety of this technology and nanoparticles in general!!

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Figure 2. Full transparency includes both producer and production transparency items.