



Impact report

Square's workshop evaluation

This report has been authored by Dr. Melisa Basol, a social psychologist specializing in the development, testing, and scaling of efforts to combat misinformation. Dr. Basol's extensive research and practical applications in this field are aimed at strengthening Square's understanding and mitigation of the impact of false information through innovative strategies and evidence-based interventions.

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Executive summary

In alignment with our mission to empower and educate the next generation of digital citizens, Square's workshop has catalyzed significant advancements in media literacy. This impact report encapsulates the measurable outcomes and participant feedback, showcasing our commitment to fostering an informed, resilient, and critically engaged youth populace from mostly disadvantaged backgrounds.

Key insights:

- Our demographic expresses critically low levels of institutional trust towards entities ranging from the government and the police to schools and media.
- Notably, scientists and researchers remain the highest trusted group, with 48.8% reporting high levels of trust.
- 66% show a high *level of conspiratorial thinking* before the workshop.
- Despite 93.4% reporting daily engagement with social media platforms, 84.1% of our participants reported skepticism towards the reliability of information encountered on social media.

Key achievements:

- Noteworthy shifts in conspiratorial thinking were observed before and after the workshop, with a remarkable decrease from 66.6% to 50%. This 16.6 percentage point reduction reflects a significant advancement toward fostering critical thinking and rational discourse among our participants.
- Crucially, the workshop significantly increased participants' *actual* skills in understanding critical online issues. By sharpening their grasp of concepts like hate speech, deep fakes, and confirmation bias, Square's workshop significantly contributed to empowering participants with the knowledge needed to navigate today's complex digital landscape.
- Our program facilitated a notable 25.5% increase in participants' *perceived* disinformation discernment skills post-workshop.
- Following the workshop, participants experienced a significant boost in political self-confidence, highlighting the program's success in nurturing political engagement and efficacy. This increase underscores the workshop's profound impact on participants' political identity and agency.
- Post-workshop, 60.7% of attendees expressed readiness to modify their online behavior, reflecting a collective move towards more responsible and discerning social media usage after engaging with Square's workshop.
- Furthermore, 58.6% of participants demonstrated a proactive stance in combating disinformation efforts, highlighting the workshop's contributions to fostering active citizenship and empowering individuals to play an active role in addressing societal challenges.

Study overview

Square teamed up with local NGOs to support young people aged 15-25 in disadvantaged areas around Paris, specifically in Clichy-sous-Bois and Mantes-la-Jolie. These cities face high levels of poverty and unemployment, making them a priority for our initiative. Using methods like word-of-mouth, social media, and community projects, our partners engaged 228 youths in a workshop led by Square in 2023. This program included a series of 13 sessions, each lasting 20 hours.

To measure the impact of our workshop, participants filled out questionnaires before and after the workshop. Out of the initial participants, we focused on 90 individuals who completed all of the key measures (i.e., conspiratorial thinking, Actively Open-minded Thinking, fact vs opinion discernment, theoretical disinformation knowledge) and at least 85% of the remaining scales in our questionnaires. This methodological approach of focusing on a subset of participants who completed all key measures and at least 85% of the remaining scales, demonstrates a strong and valid strategy for several reasons:

- By including only participants who have completed the core components of the questionnaire, the approach ensures a high level of data completeness. This is critical for analyzing changes pre- and post-intervention accurately. Data completeness is often associated with higher-quality data, as it reduces the likelihood of biases that incomplete data might introduce.¹
- This methodological approach allows for a standardized comparison of pre-and post-intervention measures. By ensuring that all included participants have data on the same measures, statistical analysis becomes more straightforward and robust, enabling more accurate assessments of the intervention's impact.²
- Participants who completed the majority of the questionnaire are likely more engaged and took the intervention seriously, potentially reflecting more reliable responses. Engaged participants are more likely to provide thoughtful and honest answers, which is crucial for measuring constructs like conspiratorial thinking and actively open-minded thinking.
- By focusing on participants who showed a high level of engagement with the intervention (as evidenced by their completion rate), the methodology helps mitigate sampling bias. This approach ensures that the results are representative of individuals who are genuinely affected by the intervention, thus making the findings more applicable to similar contexts.³

¹ See [Dong & Peng, 2013](#)

² See [Field, 2013](#)

³ See [Groves et al., 2011](#)

Methodological Overview

To evaluate Square's workshop's impact on the perceptions and knowledge of young people, we conducted pre- and post-workshop questionnaires. The end-of-workshop questionnaire mirrored the one given at the start, covering the same dimensions of interest. This allows for a before-and-after comparison for each dimension. We first estimated the workshop's average effects on all participants who completed both the initial and final assessments. We then looked at the effects on specific subgroups, including those with high levels of conspiratorial thinking, low political self-confidence, limited open-mindedness, assessed knowledge, trust in institutions, self-esteem, and overall satisfaction at the start of the workshop.

This methodology enables a comprehensive understanding of the workshop's impact, offering insights into how it affected various aspects of young people's perceptions and knowledge. It's important to interpret these findings within the context of correlation and statistical significance, noting that observed changes are significant and not due to random variation, yet cautious interpretation is advised to avoid conflating correlation with causation.

A note on interpreting statistical findings:

Throughout the report, we've carried out a series of analyses, from paired sample t-tests to correlational analyses, to assess the relationship between two variables. This approach yields a correlation coefficient ranging from -1 to 1, illuminating both the strength and direction of variable relationships. A positive coefficient indicates that variables move in tandem—increasing or decreasing together—whilst a negative coefficient signals an inverse relationship. The closer the coefficient is to 1 or -1, the more robust the relationship. A coefficient near zero, however, suggests a weak or non-existent relationship.

We observed that a negative correlation coefficient might sometimes coincide with observed increases in certain variables. This seemingly paradoxical outcome may be attributed to the scoring method of the questionnaires, where the scales are inversely related to the conceptual direction of the variables being measured. For instance, a lower score representing a positive development might still result in a negative correlation coefficient, demanding a nuanced interpretation of the data.

Statistical significance was determined using conventional thresholds (1%, 5%, 10%), with a 5% level indicating a 95% confidence that the observed correlations were not mere chance occurrences. Nevertheless, it's imperative to recall that correlation does not equate to causation. Although statistically significant correlations suggest real relationships between variables, they do not confirm a direct cause-and-effect linkage. This necessitates a careful and cautious approach to interpreting the correlations, mindful of the fact that just because two variables are correlated, it does not mean one causes the other.

Lastly, we interpret the impact of the workshop through effect sizes and percentage changes to grasp the magnitude of outcomes concisely. For example, an effect size of 0.59, considered moderate to large as per Cohen's benchmarks, indicates a significant impact. In contrast, a 25.5% change shows the practical significance in terms of outcome variance. Together, these metrics—effect size for impact strength and percentage for tangible change—enable a clear understanding of our findings, bridging the conceptual gap between a numerical effect size and its practical implication.

Audience Insights

Demographic

Our study surveyed 90 participants, averaging 19.7 years old, with a majority of 59.6% being male. A significant 64.3% are job seekers, marking a pivotal step into adulthood. Nearly half (47.6%) have completed their high school education, earning diplomas like the general and technological baccalaureate. Only 14.6% of the sample feels connected to a national community, lower than the 25% of the general population. Additionally, 29.3% feel they belong to no community, compared to 41% of the general French population. Instead, much of the sense of belonging among the sample is tied to communities of people who share similar values (religious or otherwise), speak the same language, or have similar geographical origins, and those who share the same tastes and lifestyle, encompassing a total of 56.1%.⁴ This demographic snapshot underscores the importance of examining the complexities of youth experiences, particularly those of the frequently overlooked and marginalized youth.

A positive and optimistic outlook on life

To understand the level of self-esteem, we used Rosenberg's self-esteem scale. Our results suggest that 75.9% of participants score high to very high on self-esteem.

Table 1: Self-esteem of youth

Very Low	Low	Average	High	Very high
-	-	24.05%	48.1%	27.8%

While concrete conclusions are elusive at this stage, it is intriguing to note that those who completed the questionnaires to the highest standards score substantially higher on self-esteem. This observation prompts a reflection on the importance of engaging and evaluating those who may feel less positive about themselves, life, and society. By doing so, we can potentially establish a clearer picture of self-esteem within this demographic and explore how targeted media literacy interventions might improve their resilience against misinformation and enhance their overall well-being.

A correlational analysis exploring the relationship between self-esteem and other factors, including knowledge of disinformation, indicates that higher self-esteem can contribute to a more receptive and questioning approach toward information, which is essential in effectively navigating the misinformation prevalent in today's digital landscape (see Table 5).

⁴See the [OpinionWay report](#) on the CEVIPOF-Barometer of Political Trust (January, 2022), page 56.

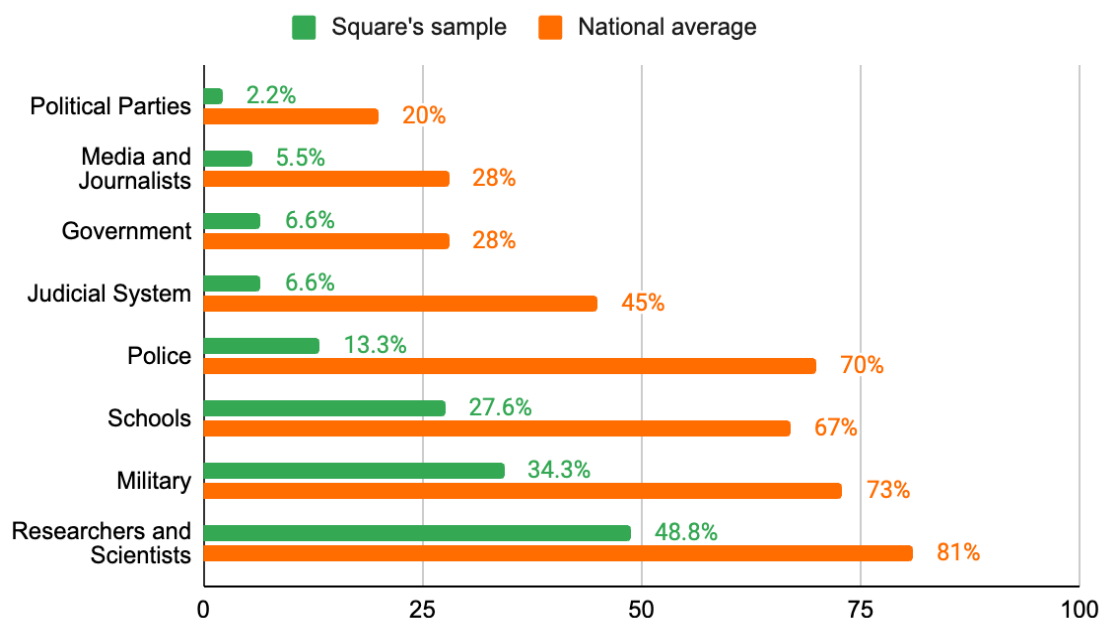
Among the young people we work with, 32.1% are satisfied with their lives, 47.1% have a neutral outlook, and 20.7% are dissatisfied. This distribution closely mirrors that of the general population, where 31% report satisfaction, 39% have a neutral outlook, and 25% express dissatisfaction with their lives, respectively.⁵ Additionally, 67.8% of our sample believes that people can change society through their choices and actions, and 81.8% believes that people can choose their lives, which is also in line with the general population.⁶

Deep-rooted institutional distrust

The bar graph illustrates the trust levels that participants reported in various institutions prior to attending Square’s workshop (Figure 1). In our assessment of trust levels towards various institutions, we categorized responses indicating 'A lot' and 'Completely' as positive trust.

Firstly, compared to the national average, Square’s participants generally exhibited lower trust in institutions. More specifically, the data suggests a stark variance in institutional trust within the sample: a mere 2.2% of participants show substantial trust in political parties, depicted as the smallest segment. In contrast, researchers and scientists command the highest trust level at 48.8%. Furthermore, our analysis indicates a significant difference in trust levels towards schools and media/journalists when comparing responses by gender, with female participants demonstrating notably higher trust in these entities than males.

Figure 1: Differences in institutional trust⁷



⁵ See [CEVIPOF report](#) (p.14) for more information.

⁶ See the [OpinionWay report](#) on the CEVIPOF-Barometer of Political Trust (February, 2021), page 13.

⁷ See the [OpinionWay report](#) on the CEVIPOF-Barometer of Political Trust (January, 2024), pages 23, 33.

Are they really looking for the truth on social media?

When asked “Do you log onto social media every day?”, 93.4% responded with “Yes”. Yet, when asked “Do you trust the reliability of information on current affairs and social issues when you consult it on social networks (e.g. Facebook, Instagram, TikTok, Snapchat, etc.)?”, 84.1% of the sample answered that they were not confident in the reliability of the information. Moreover, while nearly 91% of respondents report that they get information through social media, followed by 46.1% who use online video services (e.g., YouTube, Twitch), almost half of the group (45.5%) admits that they rarely or never verify the sources of online content. Crucially, 28% of the people report that they rarely or never check if information is true before they *share* it on social media.⁸

Social media plays a dual role. A noted paradox in our findings is the coexistence of high social media usage with low trust in the information presented on these platforms.⁹ Research suggests that social media plays a dual role in fulfilling basic human needs for connection while also being a conduit for misinformation. It reflects a nuanced relationship between technology and social behavior, stating that “the primary benefit is social connection, and that’s true for teens who are connecting with friends they already have or making new connections [...] On social media, they can find people who share their identities and interests”.¹⁰ In other words, despite the inherent skepticism towards information quality on these platforms, users continue to engage, driven by a deep-seated desire for social connectivity and identity affirmation¹¹.

This paradox is further emphasized by research, which explored the dynamics of trust and distrust in social media, revealing that even amidst widespread misinformation, the fundamental need for connection prevails, influencing user engagement intensity.¹² Additionally, the research underscores the complexity of this interaction, noting that social media news consumption is tied to higher conspiracy beliefs, yet trust in social media news moderates this relationship, highlighting the critical role of misinformation identification.¹³ Lastly, research on the demographic nuances of who trusts social media, found that women and younger users exhibit higher expectations of integrity, further emphasizing the social and empathetic dimensions of online engagement.¹⁴

⁸ The actual numbers might be even higher because some people might not want to admit this, something that scientists call ‘social desirability’.

⁹ For more information, see [here](#).

¹⁰ See [Weir, 2023](#)

¹¹ See Kenzo Nera, *Complotisme et quête identitaire*, PUF septembre 2023.

¹² See [Cheng & Chen, 2020](#)

¹³ See [Xiao et al., 2021](#)

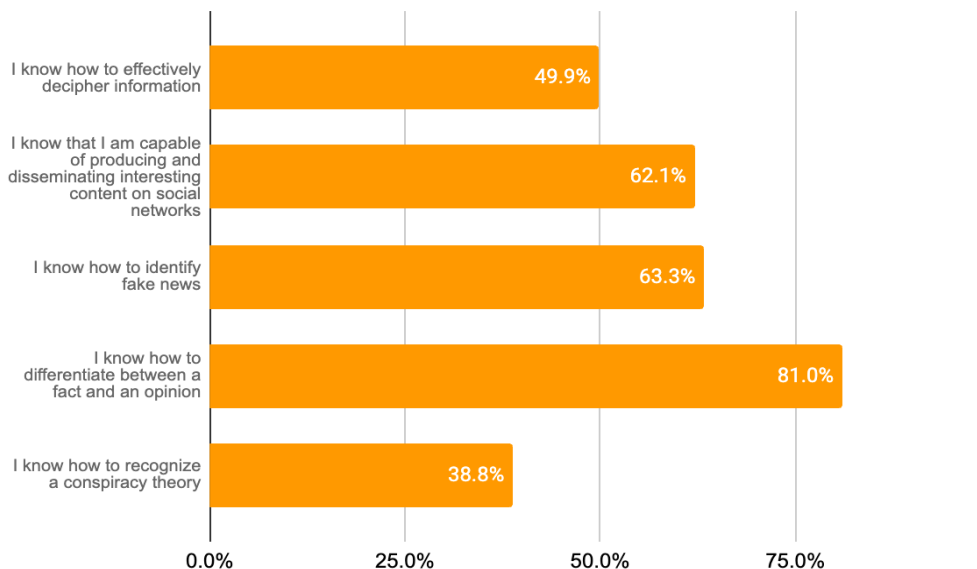
¹⁴ See [Warner-Søderholm et al., 2018](#)

Resilience against manipulation: equipping the youth with a toolbox

Perceived skills

Considering the importance of digital literacy, participants' self-assessed ability to identify and challenge misinformation was measured before and immediately after attending Square's workshop. Engaging with questions such as "I know how to differentiate between a fact and an opinion" and "I know how to recognize a conspiracy theory," participants reflected on their competence in critical online navigation skills. Consistent with research, the initial responses indicate relatively high levels of perceived skills in navigating the online environment.

Figure 2: Youth-Reported Disinformation Skills before the workshop



Significantly, our analysis reveals a marked improvement in the perception of these skills post-workshop, with a skill index increase from 49.9% on the pre-test to 75.4% post-test—a total increase of 25.5% that further underlines the workshop's effectiveness in building confidence. This advancement is statistically significant ($p < 0.001$) and carries an effect size of 0.59, underscoring the substantial impact of Square's workshop experience in bolstering digital literacy. In the context of media literacy and educational interventions in schools, an effect size above the benchmark of 0.5 can be seen as having a significant impact on educational outcomes.^{15 16}

The findings from Square's workshop suggest a substantial increase in participants' self-assessed ability to identify and challenge misinformation post-workshop. This reflects the potential of

¹⁵ See [Wisniewski et al., 2020](#)

¹⁶ See [Jeong et al., 2012](#)

targeted educational programs to improve critical digital literacy skills. While this improvement is significant, studies emphasize the discrepancy between self-assessed and actual digital competencies.¹⁷

Actual skills

Fact vs opinion

Participants' initial self-reports on the disinformation skills scale showed confidence in distinguishing fact from opinion and deemed their strongest skill at baseline. To evaluate their *actual* discernment skills, we tasked participants with classifying various statements pre- and post-workshop (see Table 2). Our analysis did not reveal a statistically significant change post-workshop ($p=0.39$), a finding in line with scholarly work evidencing a disconnect between self-perceived and actual abilities in identifying misinformation. Yet, a positive shift was also observed away from uncertainty ("I don't know") toward more decisive responses ("fact" or "opinion"). This change illustrates the *correct* directional change in statement labeling post-intervention. In other words, the updated labeling of statements post-workshop occurred in the right direction.

Lastly, notable statistically significant changes in the two last statements suggest that different factors such as sample size or specificity of the statements may have affected the results. This underscores the need for additional research that addresses the limited self-assessment and explores mitigations against resisting harmful content that goes beyond mere facts and opinions.¹⁸ Research into digital literacy and its impact on discerning misinformation reveals that while digital literacy is associated with better accuracy in identifying true versus false information, it does not necessarily translate into sharing higher-quality information on social media.¹⁹

¹⁷ See [Lyons et al., 2021](#)

¹⁸ See [Roozenbeek et al., 2023](#)

¹⁹ See [Sirlin et al., 2021](#)

Table 2: Differentiating between a fact and an opinion²⁰

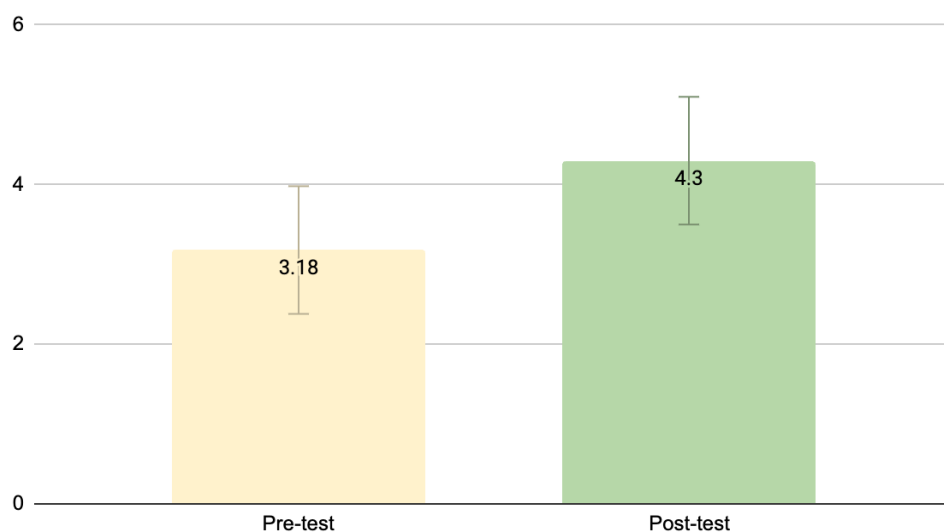
Statement	Before			After		
	Opinion (%)	I don't know (%)	Fact (%)	Opinion (%)	I don't know (%)	Fact (%)
They cheated, I won (Trump after Joe Biden's victory)	44.4	33.3	17.7	62.2	15.5	16.6
During the Yellow Vests mobilization, the government announced 2200 injured	8.8	38.8	40.2	14.4	20	60
Russia launched an attack on Ukraine on February 2, 2022	8.8	25.5	61.1	4.4	16.6	71.1
France is a secular Republic and as such effectively ignores the crime of blasphemy	36.6	28.8	27.7	36.6	25.5	31.1
Russia attacked Ukraine to prevent its NATO membership	30	38.8	41.6	31.1	27.7	33.3
There are 26 letters in the alphabet	5.5	11.1	74.4	5.5	7.7	80
We do not have the right to blaspheme when we believe in nothing*	45.5	44.4	5.5	68.8	16.6	7.7
There is not really a problem with police violence*	61.1	21.1	10	71.1	14.4	6.6

²⁰ Note: This table contrasts the evaluation of ten statements, distinguishing between factual and opinion-based responses before and after the intervention. The color coding—orange for opinion and yellow for factual identifications—visualizes the participant’s judgment shifts. Asterisked items signify statistically significant changes at the 0.05 level. Percentages not shown account for non-responses.

Tested theoretical knowledge

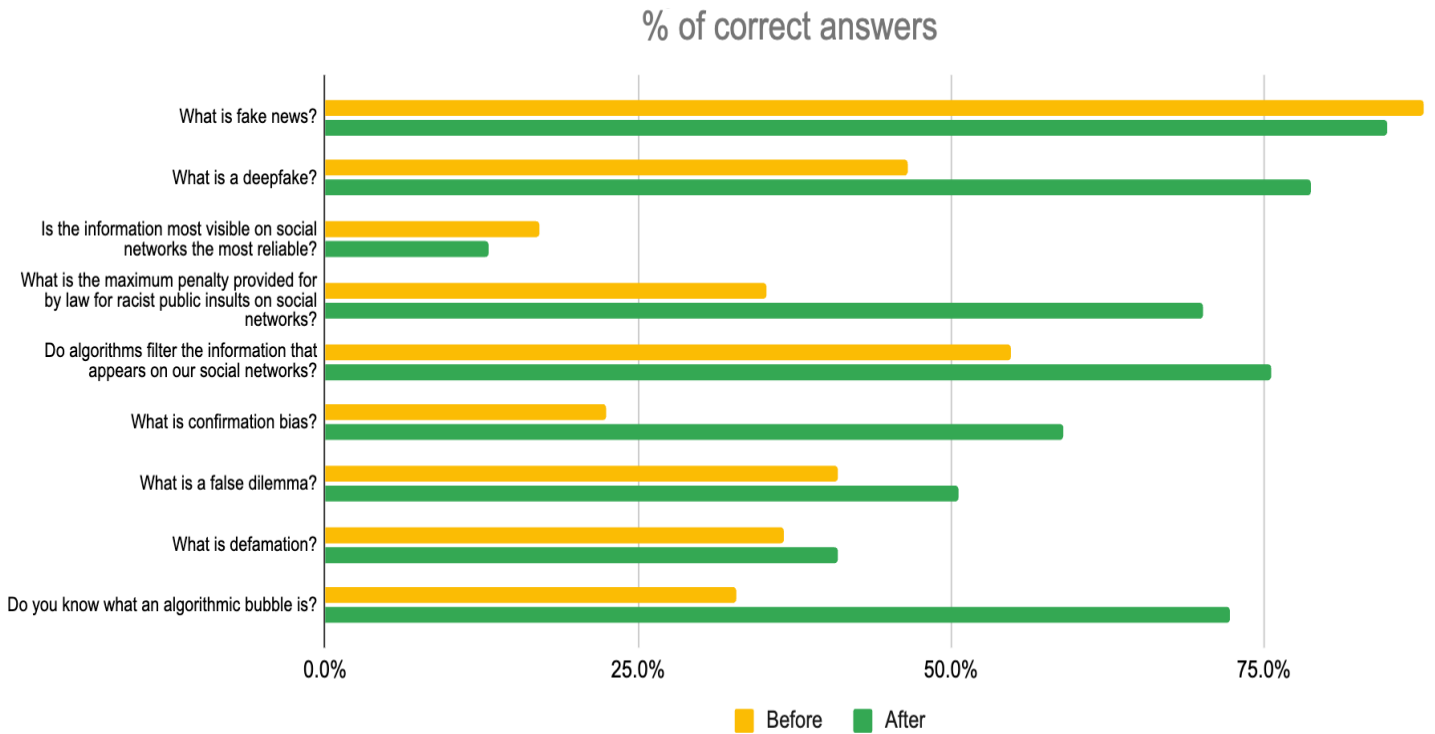
The spotlight on procedural news knowledge, as more predictive of both discerning misinformation and encouraging the sharing of quality information, sets the stage for a deeper exploration into theoretical knowledge on disinformation. In line with the correct directional change above, we ran additional analyses on participants' theoretical knowledge of disinformation (see Figure 3). Our results show a significant improvement in participants' understanding of disinformation-related concepts, with a statistically significant p-value of less than 0.001 and a large effect size of 0.72. For example, while only 5% of young people were able to name an information verification tool before the workshop, 37% were able to give a correct answer afterwards. While 20% were unable to identify the correct definition of confirmation bias, more than half were able to do so after the workshop (see Figure 4 for breakdown by statement). This underscores the workshop's effectiveness in enhancing participants' grasp of critical issues such as hate speech, deepfakes, and confirmation bias. This aligns with research indicating that educational interventions can enhance understanding of critical online issues, including those tested in Square's workshop, emphasizing the importance of not only being able to navigate but critically evaluate digital content.²¹ Consequently, we see that individuals do not only get more confident in their disinformation skills but that this confidence also corresponds with their enhanced skills after our workshops.

Figure 3: Pre-and Post-workshop differences in theoretical knowledge



²¹ See [Guess et al., 2020](#)

Figure 4: By-statement differences theoretical knowledge



Ability in detecting conspiracy theories

Belief in conspiracy theories significantly shifted following the workshop. For instance, the percentage of participants correctly recognizing the false claim that the 2020 US election was rigged almost doubled from 24.1% to 47.1%. This pattern was observed across several statements, indicating a general enhancement in participants' ability to discern falsehoods in conspiratorial claims after the workshop. Such progress underscores the effectiveness of the educational approach used in the workshop, equipping participants with critical thinking skills necessary to evaluate and challenge unfounded theories.

Focusing on foundational mechanisms

Conspiratorial thinking

Conspiratorial thinking matters significantly because it shapes individuals' perceptions of reality, influences their decision-making processes, and can profoundly affect societal trust, public health initiatives, and democratic institutions.²² The development and validation of the ACBQ, aimed at measuring adolescents' beliefs in conspiracy theories, highlight the importance of understanding the psychological antecedents and consequences of conspiracy thinking in young populations. This is particularly relevant for designing interventions that can effectively counteract the spread of conspiracy theories and misinformation among adolescents.²³ Thus, understanding these individual differences is key to developing informational interventions that can target these underlying factors, thereby inciting meaningful changes in thinking and building resilience against the allure of conspiracy theories.²⁴ Subsequently, Square included the ACBQ scale to identify whether the workshop effectively reduced beliefs in conspiracy theories.

Our analyses identified a significant shift in attitudes towards conspiratorial beliefs. Initially, a substantial two-thirds (66.6%) of the participants registered some level of agreement with conspiratorial statements. Post-workshop, this figure declined by 16.6 percentage points, settling at an agreement level of 50%. This substantial reduction is not only statistically significant ($p = 0.002$) but is further characterized by a notable effect size (Cohen's $d = -0.6$), affirming the effectiveness of the workshop in altering beliefs in conspiracy theories. This is aligned with a systematic review that assessed the effectiveness of various interventions in countering conspiracy beliefs and found that interventions fostering an analytical mindset or teaching critical thinking skills were notably successful in altering such beliefs.²⁵

Lastly, our findings revealed a significant negative correlation between changes in conspiracy beliefs and improvements in the ability to discern fake news post-workshop ($r = -0.435$, $p = 0.004$). This indicates that as participants' belief in conspiracies waned, their skill in identifying misinformation correspondingly enhanced.

This pattern suggests that addressing conspiratorial thinking can have broader cognitive benefits, enhancing individuals' analytical abilities and resilience against false narratives. This correlation underlines the effectiveness of interventions that promote an analytical mindset and critical thinking skills.

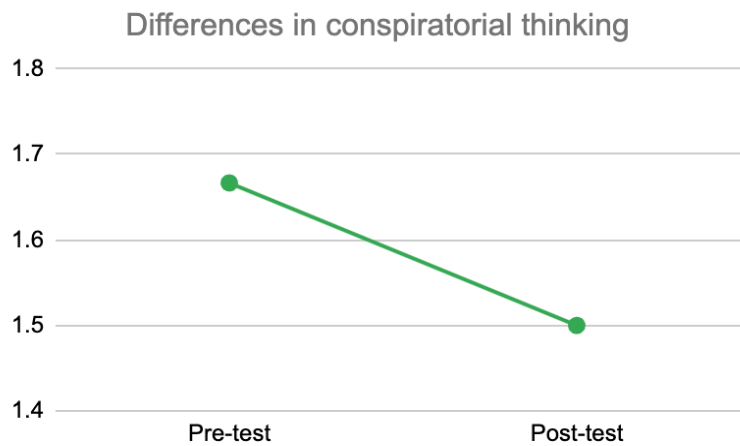
²² See [Kociv & Fuchsli, 2018](#)

²³ See [Jolley et al., 2021](#)

²⁴ See [Larsen et al., 2020](#)

²⁵ See [O'Mahony et al., 2023](#)

Figure 5: Differences in belief in conspiracies



Note: This line graph illustrates the difference in conspiratorial thinking before and after participation in the workshop.

At a more nuanced level, we can see changes in agreements with specific conspiratorial statements in the table below (Table 3). Notably, there was a decrease in agreement across several statements post-workshop, indicating a potential shift in participants' attitudes towards these conspiratorial ideas. For example, there was a significant decrease in the belief that "some diseases were created by the government to be used as weapons" (48.8% before, down to 38% after) and that "governments have deliberately allowed diseases to spread among certain groups of people" (49.9% before, reduced to 34.3% after).

These highlighted shifts suggest the workshop may have influenced participants' perceptions of government-related conspiracy theories. Conversely, the belief that "secret groups control people's minds without their knowledge" saw an unexpected increase (from 37.7% to 44.4%), which could highlight a drawback of a workshop discussing a wide number of manipulation techniques and warrants further investigation into the factors contributing to this change.

Overall, the data indicates a general trend toward reduced agreement with conspiratorial statements after the workshop, with specific nuances that require further research. However, it is important to note that the distinctions between skepticism and conspiracy can sometimes blur, particularly when addressing provocative statements like those assessing government transparency and surveillance. It is plausible to consider some level of skepticism toward government actions as rational, particularly in light of historical events where information has been withheld or surveillance has been enacted beyond public knowledge. Such skepticism can be reflective of a critical engagement with government actions and policies, especially for an audience showing extreme amounts of distrust towards these bodies. This nuanced view acknowledges that not all doubt is unfounded, and some level of critical analysis is healthy in a well-functioning democratic society.²⁶

²⁶ See [Borradori, 2016](#); [Clarke, 2002](#)

Table 3: Shifts in perceptions of conspiratorial statements: Pre- and Post-workshop agreement

	<i>Before</i>	<i>After</i>
Statement	Agreement (%)	
The government deliberately hides important information from the public	86.6	82.1
The government secretly monitors people	68.6	65
Some political groups have secret plans that are not good for society	86.6	68.8
Some diseases were created by the government to be used as weapons	48.8	38
The government is often aware of terrorist attacks and lets them happen	43.3	44.3
Governments have deliberately allowed diseases to spread among certain groups of people	49.9	34.3
Secret groups control people's minds without their knowledge	37.7	44.4
Secret societies control politicians and other leaders	54.3	54.4
Secret societies influence many political decisions	65.5	63.0

Open-mindedness

Open-mindedness, as quantified by the Actively Open-minded Thinking (AOT) scale, is argued to be essential in decision-making, belief evaluation, and evidence assessment. This psychological construct encourages the examination of different viewpoints, challenges personal beliefs, and adapts thinking based on new information, which is vital for sifting through complex information environments.

Research has demonstrated that open-mindedness is associated with improved decision-making and reduced cognitive biases, fostering a more nuanced processing of new information and reducing biases, judgment errors, and dogmatism.²⁷ Accordingly, Square’s workshop incorporated pre- and post-measures of Actively Open-minded Thinking (AOT) to evaluate its effect on participants' open-mindedness. Initially, participants displayed a neutral to supportive attitude toward open-mindedness, juxtaposed with disapproval of dogmatic statements (e.g., ‘Changing one’s mind is a sign of weakness’). Post-workshop, the aggregate approval of open-mindedness statements saw a

²⁷ See [Haran et al., 2013](#); [De Keersmaecker & Roets, 2017](#); and [Pennycook et al., 2023](#)

modest increase from 45.5% to 50%, although this change was not statistically significant (see Table 4). This could be attributed to the small sample size (N=90) and limited statistical power, or the complexity of the concepts being assessed—particularly given the inclusion of reverse-coded items in the measurement.

Thus, it is conceivable that the complexity of the statements presented in the AOT scale, which often require nuanced understanding and self-reflection as well as familiarity with the constructs being measured, could result in less consistent responses from those with lower initial open-mindedness. This subset of participants may struggle more with the self-assessment required by the AOT, leading to responses that do not capture a true change in their open-mindedness post-intervention. In the realm of psychological research, this phenomenon is not uncommon; individuals may provide answers that seem random or inconsistent when the material is not fully understood or when it fails to resonate with their lived experiences.

Further complicating this matter is the notion that progress in open-mindedness may not manifest linearly or predictably, especially in those who begin with weaker dispositions. The journey toward becoming more open-minded can be uneven and may require more time and sustained effort than a short-term workshop provides or, at least, repeated measurements to explore any possible effects of the intervention that may not occur immediately after the workshop. Moreover, the AOT scale itself, as some scholars have pointed out, may not be entirely adequate in capturing the essence of actively open-minded thinking, particularly in diverse populations or educational settings.^{28 29}

To elucidate these issues, future research could:

- Utilize simplified or alternative measures of open-mindedness that are more accessible to participants with lower baseline levels.
- Implement longitudinal designs that track changes in open-mindedness over extended periods, offering insights into the developmental trajectory of this trait.
- Conduct qualitative studies to explore participants' understanding of the AOT statements and their reflections on open-mindedness in a more nuanced manner.

In the subsequent analysis, a noteworthy finding emerged specifically from statements 5 and 10. Despite our anticipation of an overarching trend towards greater open-mindedness post-workshop, these items revealed significant shifts in the opposite direction, highlighting a complex interplay between self-esteem, confidence, and receptiveness to new information. This observation aligns with previous research suggesting that individuals may often equate confidence and decisiveness with competence and strength, potentially at the expense of open-mindedness and flexibility.³⁰ The

²⁸ See [Janssen et al., 2020](#)

²⁹ See [Stanovich & Toplak, 2019](#)

³⁰ See [Kruglanski, 2004](#)

cultural emphasis on certainty and the stigmatization of changing one's stance as a sign of weakness could explain the increased agreement with these statements post-intervention.³¹

This trend may reflect broader societal values that prioritize decisiveness over the willingness to update beliefs in response to new evidence – underscored by the current socio-political climate and media landscapes which often reward certainty over accuracy.³² Consequently, more research on how societal norms and personal traits interact to shape attitudes toward information processing and belief revision is needed.

Table 4: Pre-post difference of open-mindedness

Here, participants indicated their level of agreement with a series of questions by choosing between 5 possible answers, ranging from "Strongly disagree" to "Strongly agree". To establish a positive agreement, we've combined "Somewhat agree" and "Strongly agree".

	<i>Before</i>	<i>After</i>
Statement	Agreement (%)	
True experts are willing to admit that they are not sure they know the truth.	48.8	47.7
People should consider evidence that opposes their preferred conclusions	48.9	53.5
Being indecisive or uncertain is the result of confused thinking	52.9	46.6
People should rethink their conclusions when new relevant information is available	73.5	62.1
Changing one's mind is a sign of weakness*	10.3	13.4
People must actively search for reasons why they might be wrong	69	62.1
It is acceptable to ignore evidence that opposes your beliefs	32.6	33.7
It is important to be true to your beliefs even when evidence is presented against them	55.8	45.4
There is nothing wrong with being undecided on many issues	77.1	66.2
Faced with a difficult question one should try to think of more than one possible answer before coming to a conclusion*	82.4	74.7
It is better to be confident in a conclusion even if there are good reasons to question it	46.5	44.7

³¹ See [Anderson et al., 2012](#)

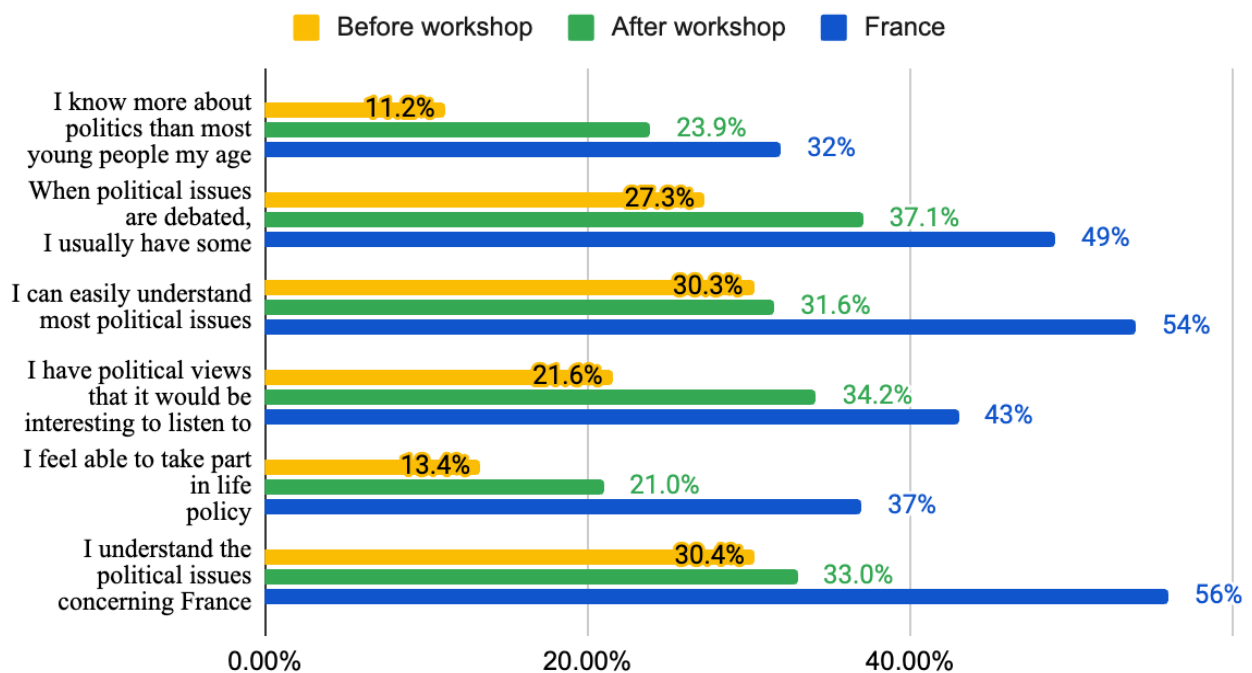
³² See [Nyhan & Reifler, 2010](#)

*These statements are the only ones where participants demonstrated a significant change after taking part in the workshop, with $p=0.003$, Wilcoxon effect size: 0.47 for statement 5 and $p=0.02$, Wilcoxon effect size -0.36 for statement 10.

Political self-confidence

After attending Square's workshops, participants exhibited a significant boost in political self-confidence, as demonstrated by the data ($p = 0.003$; Cohen's $d = 0.32$). This increase in confidence is evident across various metrics of political engagement and understanding. For example, the proportion of participants feeling they knew more about politics than their peers rose from 11.2% to 23.9%, although still below the national average of 32%. Similarly, confidence in understanding political issues relevant to France improved from 30.4% to 33.0%, compared to a national average of 56%. These results, illustrated in Figure 6, show a general enhancement in political self-assurance among the youth following the workshop, although they still lag behind the overall national confidence levels in political matters.

Figure 6: Youths' political self-confidence compared to national average



Exploring the dynamic interplay

Our correlational analyses explored the interplay between various factors related to media literacy and self-perception. Some of the key insights include:

- The strong positive correlation between *reported* disinformation skills and the *actual* ability to discern between facts and opinion ($r = 0.328$, $p = 0.002$) underscores the role of critical thinking in media literacy, consistent with the literature that critical thinking skills are crucial for discerning the validity of information.
- Post workshop, perceived disinformation skills are positively correlated with actual disinformation knowledge ($r = 0.324$, $p = 0.002$). The observation that these two variables are positively correlated suggests they move together—individuals who rate their ability to identify misinformation higher also tend to score higher on measures of disinformation knowledge.
- A significant negative correlation was observed between open-mindedness and self-esteem ($r = -0.298$, $p < 0.01$) and a significant negative correlation was observed of self-esteem with disinformation knowledge ($r = -0.226$, $p < 0.05$). These findings suggest that individuals with higher self-esteem are more likely to be open-minded and have a greater understanding of disinformation.
- The observed positive correlation between news interest and social media distrust ($r = 0.331$, $p < 0.001$) may reflect a relationship where individuals with a keen interest in current events are more critical of social media information, possibly due to heightened awareness of misinformation. This aligns with research suggesting that higher levels of news literacy may lead to better identification of unreliable sources and skepticism toward the credibility of social media content.³³
- Political confidence is inversely correlated to conspiratorial thinking ($r = -0.29$, $p < 0.01$), which could be interpreted as individuals having higher trust in their political skills, and the propensity to subscribe to conspiracy narratives declines. This is supported by research that suggests that higher political efficacy (a form of political confidence) can decrease the likelihood of endorsing conspiracies.³⁴
- Open-mindedness shows a negative correlation with news interest ($r = -0.213$, $p < 0.05$), potentially indicating that more open-minded individuals may prefer more diverse sources of information rather than mainstream news outlets. This is supported by a meta-analysis, demonstrating a strong negative correlation between openness to experience and political conservatism – suggesting that open-minded people may prefer diverse and alternative

³³ See [Lewandowsky et al., 2017](#)

³⁴ See [Van Prooijen & Acker, 2015](#)

media sources over traditional ones, seeking information that aligns with their curiosity and appreciation for novel experiences.³⁵

Where possible, we specifically analyzed to gauge the differential impact of the workshop – that is, a correlational analysis on the pre-post differences of these variables to offer a nuanced view of the participants' development in media literacy skills through the course of the program. These correlations illustrate the intertwined nature of self-perception, cognitive skills, and trust. For instance, individuals who perceive themselves as more adept at discerning disinformation tend to engage with media content more critically. This self-assessment is not just a reflection of cognitive ability but also influences trust in information sources. Cognitive skills, including critical thinking and the ability to differentiate between fact and opinion, are essential for navigating the modern media landscape. Trust, particularly in the context of media, emerges as both a product and a prerequisite of effective media literacy. The interdependence of these factors suggests that enhancing media literacy is a multifaceted process, requiring attention to not only the informational content but also the development of cognitive abilities and the nurturing of a healthy, questioning attitude towards sources of information.

Table 5: Correlational analysis

Variable		Self-esteem	Satisfaction	Institutional trust	Social media distrust	News interest	Political confidence	Conspiratorial thinking	Open-mindedness	Fact vs Opinion	Reported Disinfo skills
Satisfaction	Pearson's r	0.102	—								
	p-value	0.338	—								
Institutional trust	Pearson's r	0.029	0.105	—							
	p-value	0.783	0.325	—							
Social media distrust	Pearson's r	0.038	0.149	0.226*	—						
	p-value	0.722	0.162	0.032	—						
News interest	Pearson's r	0.076	-0.054	0.331**	0.128	—					
	p-value	0.477	0.616	0.001	0.23	—					
Political confidence	Pearson's r	0.075	0.124	-0.086	-0.011	-0.29**	—				
	p-value	0.483	0.245	0.421	0.919	0.006	—				
Conspiratorial thinking	Pearson's r	-0.033	0.041	0.045 <i>(-0.33)</i>	-0.109	-0.179	0.1	—			
	p-value	0.755	0.703	0.674	0.308	0.091	0.351	—			
Open-mindedness	Pearson's r	-0.298**	0.056	-0.043	-0.017	-0.213*	0.136	0.184	—		
	p-value	0.004	0.597	0.686	0.874	0.043	0.203	0.082	—		
Fact vs Opinion	Pearson's r	-0.186	0.227*	-0.068	0.162	-0.038	-0.131	-0.115	0.199 <i>(0.42)</i>	—	
	p-value	0.079	0.032	0.524	0.128	0.724	0.22	0.278	0.06	—	
Reported Disinfo skills	Pearson's r	-0.226*	0.215*	-0.034	0.062	-0.286**	0.286**	-0.048	0.198	0.324**	—
	p-value	0.032	0.042	0.752	0.562	0.006	0.006	0.651	0.061	0.002	—
Disinfo knowledge	Pearson's r	-0.229*	0.064	0.117	-0.086	-0.019	0.086	0.05	-0.105 <i>(0.47)</i>	0.034 <i>(0.57)</i>	0.181
	p-value	0.03	0.548	0.273	0.42	0.861	0.418	0.642	0.323	0.749	0.088

*p<.05, ** p < .01, *** p< 0.001

Note: The numbers shown in italicized brackets represent results obtained from a secondary analysis. This analysis was conducted with a larger group of participants and took into account a higher rate of non-responses. These differences help highlight how the findings vary with changes in sample size and response rates.

³⁵ See [Osborne et al., 2018](#)

Empowering the next generation: Further impact of the workshop

At the end of the workshop, participants were asked to reflect on what they had learned by answering questions about their perceived progress. These questions covered areas such as their improved ability to navigate online environments, changes in how they plan to interact on social media, and their willingness to engage in efforts against disinformation. The next section presents an analysis of these responses, offering insights into the outcomes of Square's workshop from the participants' perspectives. This includes a look at the key areas of media literacy where participants felt they had made significant strides.

Participants reported high media literacy skills after the workshop. Their reflections on the learning experience revealed a consensus around key competencies acquired, exemplified by statements like 'I have learned to better identify fake news.' Despite some differences in the levels of agreement across various statements (refer to Table 9), an average agreement rate of 69.7% demonstrates a substantial consensus among participants on their enhanced ability to navigate the complexities of digital information – attributing this growth to their participation in Square’s workshop.

Table 6: Self-reported enhancement of media literacy skills post-workshop

Statement	In agreement (%)
I have learned to better distinguish between a real conspiracy and a conspiracy theory	66.2%
I have learned to better distinguish between a fact and an opinion	75.7%
I have learned to better identify fake news	71.6%
I have learned to better produce and disseminate interesting content on social networks	63.5%
I have learned to more effectively decipher information	71.7%

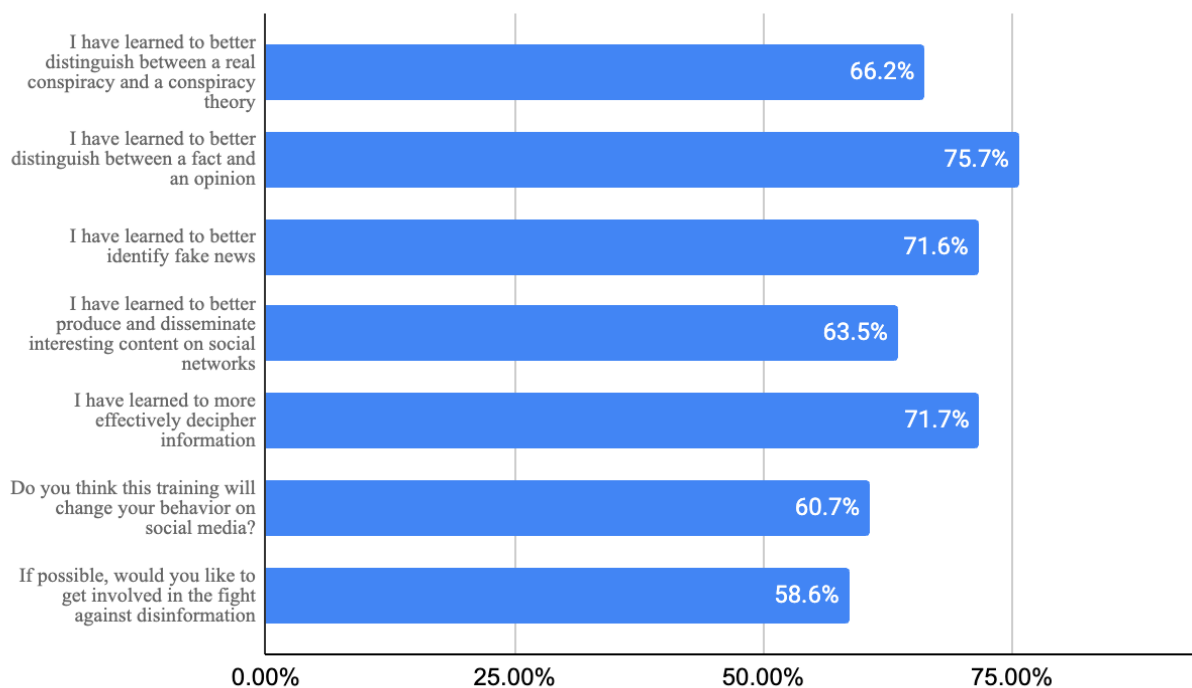
Note: The percentages indicate the proportion of participants who "mostly" or "completely" agreed with the statements, showcasing the perceived efficacy of the workshop in enhancing critical media literacy skills among the youth.

Participants report significant intentions to behavioral changes online. Upon being asked, "Do you think this workshop will change your behavior on social media?" a noteworthy 60.7% of participants affirmed the positive impact of Square’s workshop on their future behavior online. This agreement was quantified using a scale of 1-10 and all varying degrees of agreement above neutral stance (5)

were included to ensure a comprehensive view of the workshop's effectiveness in fostering more thoughtful and discerning social media engagement among attendees. This insight underscores the workshop's pivotal role in shaping digital citizenship, aligning with our commitment to empowering individuals to navigate the digital landscape with confidence and critical acumen.

Participants expressed a strong sense of empowerment and willingness to engage in combating disinformation. When inquired, "If possible, would you like to get involved in the fight against disinformation (e.g., partnering with an association, participating in a documentary, informing your friends)?", 58.6% indicated their eagerness to contribute to future disinformation countermeasures. Beyond intentions to modify social media behaviors, these findings highlight the workshop's impactful role in not only enhancing participants' motivation but also in encouraging them to actively participate in wider efforts against disinformation, ranging from personal circles to broader community initiatives.

Figure 7: Participants' learnings and reflections following Square's workshop



Recommendations

Evaluation priorities

- Incorporate a layered measuring approach that moves beyond flawed self-assessment. To adequately assess whether individuals, compared to their *perceived* beliefs and skills, actually get better at identifying and resisting harmful and manipulative content, consider incorporating more skills-assessment-focused measures in future interventions.
- Introduce measures for factors that may be underpinning some of the results discussed in this report, including but not limited to, memory and reading comprehension, to control for variability in understanding and interpretation of questions.
- To effectively address overconfidence and its spread within social or learning environments, future interventions should focus on dynamic tasks coupled with consistent performance feedback and encourage more conservative self-assessment practices. This dual approach aims not only to reduce individual misconceptions about personal performance but also to prevent the social transmission of overconfidence, promoting a culture where balanced self-perception is valued and reinforced through positive social feedback and enhanced motivation for skill development.^{36 37}

Evaluation infrastructure

- Utilize experimental designs to establish causality, particularly in understanding the influence of open-mindedness on media literacy outcomes.
- Develop standardized Likert-scale items following best practices in scale construction to ensure reliable measurement of key variables.³⁸
- Shorten pre-post questionnaires to focus on core variables directly related to the workshop's objectives, streamlining data collection and analysis processes.
- Incorporate longitudinal design for exploration of the long-term effects of the workshop.
- Leverage technology such as tablets or online platforms to collect detailed data on participant engagement and response times, offering insights into comprehension levels and areas requiring reinforcement.³⁹

Future directions

- Investigate the sustainability of changes in media literacy and resistance to misinformation, exploring the potential need for refresher sessions or follow-up interventions.⁴⁰
- Embed formative assessment tasks within workshops to evaluate participants' real-time abilities in differentiating manipulative content from non-manipulative content.

³⁶ See [Cheng et al., 2021](#)

³⁷ See [Visser et al., 2019](#)

³⁸ See [Boone & Boone, 2021](#)

³⁹ See [Otero & Otero, 2012](#)

⁴⁰ See [Georgiou et al., 2023](#)

- Develop and test prebunking modules within media literacy workshops to assess their effectiveness in preemptively reducing susceptibility to misinformation.
- Further explore the intricate relationship between self-esteem, open-mindedness, and disinformation knowledge to better understand their interconnected roles.
- Examine the adequacy of active open-minded thinking in fostering digital citizenship and its effectiveness in promoting critical engagement with digital content.
- Explore the effectiveness of researchers and scientists as trusted messengers in media literacy interventions, considering their potential impact on participants' perceptions and behaviors.