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Central bank communication and trust: an experimental study on the European Central Bank and the general public

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Master 2 Politiques publiques
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**Central Bank Communication and Trust:
An Experimental Study on the European Central Bank
and the General Public**

Sarah MOCHHOURY

Directeur de mémoire : Professeur François Facchini

2020/2021

« L'Université Paris 1 Panthéon-Sorbonne n'entend donner aucune approbation ni désapprobation aux opinions émises dans ce mémoire. Ces opinions doivent être considérées comme propres à leur auteur »

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Central Bank Communication and Trust:

An Experimental Study on the European Central Bank and the General Public

Sarah Mochhoury¹

Abstract

Abstract (EN): While it has become clear that communication is a monetary policy tool for central banks, and extensive research has been conducted on central bank communication with financial markets, little is known so far on central bank communication with the general public. Our research provides new insights into this field, confirming that the efforts of central banks to connect with people are not in vain. In a randomised controlled trial, we focus on the determinants of understanding and trust in the communication of the European Central Bank (ECB) about the Pandemic Emergency Purchase Programme, which was set up as part of the Bank's response to the Covid-19 crisis. Key findings include that the ECB's simplified and relatable communication contributes to increased understanding of the central bank among a wider public. The simplified content also has a positive impact on perceptions of the ECB among laypeople, indicating that building understanding of the ECB's communications can help build trust in the central bank.

COMMUNICATION DES BANQUES CENTRALES ET CONFIANCE: UNE ETUDE
EXPERIMENTALE SUR LA BANQUE CENTRALE EUROPEENNE ET LE GRAND PUBLIC

Abstract (FR) : Alors que la communication est devenue un outil de politique monétaire des banques centrales, et qu'il existe une riche littérature sur la communication des banques centrales avec les marchés financiers, la communication des banques centrales avec le grand public a jusqu'alors été peu étudiée. Notre étude apporte de nouvelles perspectives dans ce domaine, confirmant que les efforts de communication des banques centrales avec le grand public ne sont pas vains. Dans un essai contrôlé randomisé, nous étudions les déterminants de la compréhension et de la confiance dans la communication de la Banque centrale européenne (BCE) sur le « Pandemic Emergency Purchase Programme », créé par la BCE pour faire face à la crise du Covid-19. Les principaux résultats montrent qu'une communication simplifiée et adaptée de la BCE permet d'améliorer la compréhension d'un plus grand nombre. Le contenu simplifié a aussi un effet positif sur les perceptions que les non-experts ont de la BCE, indiquant que renforcer la compréhension dans la communication de la BCE peut renforcer la confiance dans la banque centrale.

JEL Classification/Classification JEL: A12; A13; A22; C21; C83; C90; C91; C93; D83; D91; E52; E58; E70; G41; G53; M38;

Keywords: Central bank communication; Trust; Behavioural economics; Experimental economics; European Central Bank;

Mots clés : Communication des banques centrales ; Confiance ; Economie comportementale ; Economie expérimentale ; Banque centrale européenne ;

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Section 1: Introduction

The vaccination campaign in France in the midst of the Covid-19 pandemic has shown the importance of simple, clear and relatable communication to build awareness and trust in the vaccine among the population. If this example might seem far removed from the world of central banking, similar issues are at stake when it comes to central bank communication and trust with the general public. Accessible and understandable communication on the central bank's activities can build trust in the institution (Bholat et al., 2018; 2019). The current European Central Bank (ECB) President Christine Lagarde has emphasised the need to speak not only to financial markets but also to the general public. At the European Parliament in September 2019, she declared: "The ECB needs to be understood by the markets that transmit its policy, but it also needs to be understood by the people whom it ultimately serves. People need to know that it is their central bank, and it is making policy with their interests at heart. One of the priorities of my Presidency, if confirmed, will be to reinforce that bridge with the public."²

In recent years, monetary policy has become more challenging in an environment of dampened economic growth and lower real interest rates. The concern over whether such low interest rates would have negative distributional effects (Bernanke, 2012) has only accentuated this challenging environment. Against this backdrop, major central banks in advanced economies have introduced unconventional monetary policies; these require further communication efforts with financial markets, notably with the use of forward guidance, i.e. the communication on the future path of interest rates in order to reduce in so far as possible uncertainty in financial markets. Communication has become essential to explain policy measures and anchor inflation expectations. Using the framework of rules versus discretion (Barro and Gordon, 1983), here, communication can justify the place of discretion, and explain the rule of the ECB, that is to say the inflation target of below, but close to, 2% over the medium term. Communication accompanies the rule by sharing information on the expected future path of interest rates. Discretion can thus be a complement to the rule (Dwyer, 1993), as the goal is set but the central bank can decide on the policy to put in place to reach the goal. On this front, central banks have been quite well heard and listened to by financial markets.

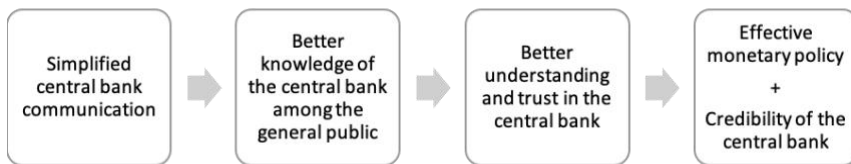
While central banks' communication efforts are now growing to reach a wide range of audiences, little research exists so far on central bank communication with the general public. As Blinder et al. (2008) noted, "All the research to date has focused on central bank communication with the financial markets. It may be time to pay some attention to communication with the general public". As the broader public may lack the knowledge and interest in

² Opening Statement by Christine Lagarde to the Economic and Monetary Affairs Committee of the European Parliament, September 4, 2019

information about central banking (Kumar et al., 2015; Binder, 2017), it is crucial to consider the general public as a separate audience with whom the central bank communicates. Communication that relates with the target audience becomes all the more important as dissatisfaction with public policies has been rising and trust in European institutions has been falling dramatically since the 2008 Global Financial Crisis (GFC). It appears that it takes much longer to re-build trust in the central bank than the time it takes to lose it following a shock that affects economic policy uncertainty (Istrefi and Piloiu, 2020).

Figure 1 shows how simplified communication can increase the public's knowledge of the central bank using relatable and engaging content. Simplified, transparent and holistic communication is important to build awareness in central bank topics (Candia et al., 2020). Increased relatability in central bank communication can help improve understanding of the messages among the general public and satisfaction with the institution (Bholat et al., 2018; 2019; Behavioural Insights Team, 2012). This is all the more important as public support is key for the effectiveness of monetary policy (Bank of England, 2003; Kohn, 2011) and the central bank's credibility. Communication that reaches the public is thus key to sustaining the central bank's credibility (Coibion et al., 2020).

Figure 1: The benefits of simplified central bank communication



Source: author

Understanding the effect of central bank communication on the knowledge and beliefs of the general public is important as the effectiveness of monetary policy depends on the extent to which people understand its goals and strategies (Bernanke, 2007; Candia et al., 2020). Communication can also help build trust, which is essential to enhance central bank accountability and independence. It is therefore desirable that central banks communicate more with the general public, as part of an effort to increase people's awareness, understanding and trust in central banks and monetary policy decisions and their implications. Skillful communication appears to be one of the key solutions to increase trust in all economic policies (Edelman, 2019). Building trust in central banks is also important given the key role played by trust in the successful functioning of democracy and institutions (OECD, 2017).

In this vein, this thesis aims to fill the gap in the existing literature on central bank communication with the general public. We bring empirical evidence on the links between simplified central bank communication and understanding and trust in the ECB's communications among the general public.

There is substantial empirical evidence on the impact of central bank announcements on financial markets, but very little on how central banks communicate with the public and how their communication affects people's beliefs about the central bank and trust in the institution. The Bank of England (BoE) has conducted research on the impact of its layered communication on understanding and satisfaction with the Bank among the general public (Haldane and McMahon, 2018; Bholat et al., 2018; 2019), showing the relevance of simplified and relatable communication to increase comprehension and build trust. To the best of our knowledge, our study is the first to conduct a controlled experiment to empirically assess the impact of the ECB's simplified and relatable communication. We surveyed economics students and non-economics students. Participants in each group were randomly assigned to the simplified publication (treatment group) or the technical publication (control group). Our study aims to widen the focus on central bank communication by not only looking at economic outcomes of such communication but examining how communication can also build understanding of, and trust in, the central bank, which are key for the effectiveness of the central bank's policies, for its credibility and accountability towards society. Our research angle appears to be all the more pertinent today as public understanding and trust in European institutions has been declining while central banks have been given more and more responsibilities – the strategic role of central banks during the Covid-19 crisis is one very telling example.

Our results show that simplified and relatable communication by the ECB on the Pandemic Emergency Purchase Programme (PEPP) has a positive and statistically significant effect on comprehension of the PEPP, especially among non-economists. Our results also indicate that participants are more likely to report an improvement in their perceptions of the ECB, an indicator of trust, when they read the simplified communication. Our findings provide evidence that central banks' efforts to reach a wider public are not in vain: simplified language to which people can relate positively affects people's understanding of the ECB. Our findings have policy implications in the sense that they provide empirical evidence to enhance central bank communication practices: central banks can reach a wider public with relatable communication. This is all the more important as people's knowledge of, and trust in, the central bank is key to improving its credibility and the effectiveness of its monetary policy.

The remainder of this paper is organised as follows. Section 2 consists of a literature review on central bank communication with the general public, the characteristics of the general public as a different audience than financial markets and the role of communication as a tool for building understanding of, and trust in, central banks. Section 3 describes the methodology of the survey we conducted to empirically assess the impact of the ECB's simplified and relatable communication on the public's understanding of, and trust in, the ECB. Section 4 outlines the results of our study, including descriptive statistics and regression analysis. Finally, section 5 concludes and discusses possible future research paths on central bank communication with the general public.

Section 2: Literature review

While there is extensive research on the communication of central banks with financial markets, little is known on central bank communication with the general public and how communication can help build understanding of, and trust in, a central bank, which is key for the effectiveness of monetary policy and the central bank's accountability and credibility. This thesis contributes to the growing literature on central bank communication.

One strand of the literature acknowledges the difference between central bank audiences. A central bank's audience can be divided between the general public and its political representatives on the one side, and the financial markets on the other (Blinder and Wyplosz, 2004). Evidence shows that the general public form their inflation expectations differently from financial markets and analysts (Reid, 2015): the author studied the process by which the rationally inattentive public in South Africa form their inflation expectations. Understanding such processes can help the central bank to communicate effectively with the general public as a group distinct from financial markets. The inflation expectations of the general public are one of the channels through which the central bank's monetary policy can achieve its objective of keeping prices stable. As the central bank's audience includes different groups, its policy and communication should be formed with this in mind.

In this vein, another strand of the literature, which is not limited to central banking, shows that there are transaction costs for the general public to receive and process understandable information. People are very reluctant to acquire information that is not easy to process, as they have a limited capacity to process and transmit information (Sims, 2003; 2005; 2010). They receive noisy information and so only have partial information. More importantly, this "rational inattention" seems to be more pronounced when it comes to the reception of central bank communication. Empirical evidence from the United States and Argentina shows that the general public pay less attention to information about inflation (Carvalho and Nechio, 2014; Dräger et al., 2015): they will choose rationally to be inattentive to variations in the inflation rate in the short-term if the central bank has credibility, as it is costly for them to search and process the information and these costs outweigh the potential benefits of obtaining the information (Cuckierman, 2007).

An implication of this rational inattention literature is that the general public will pay attention to the central bank's communication if they think it can be of benefit to them and if they find that it does not cost them a lot to do so. However, this also implies that they understand the communication about monetary policy: if their comprehension of the messages is very low, it is likely that they will not pay attention nor be able to evaluate the benefits for them. A conclusion from the ECB's public consultation as part of its strategy review illustrates this point well: "Many respondents indicated they would like to see more transparent explanations of the ECB's decisions, together with the

reasoning behind them and the impact of its policies, including the benefits, risks and negative effects.”³ The general public’s knowledge of economics or finance thus plays a determining role in their decision to pay attention or not, as low financial literacy implies high transaction costs to receive and process the information on central banking. The decision to pay attention or not is especially important for the ECB as research shows that the desire to be informed is a key determinant of citizens’ trust in the ECB (Hayo and Neuenkirch, 2014).

Recently growing literature shows that knowledge of central banking or economics among the general public is positively correlated with people’s approval of, and trust in, the central bank’s policy. Studies in the field of behavioural finance have shown that more accessible and relevant information improves the public’s engagement (Garner, 2005; Perry and Bumenthal, 2012; Behavioural Insights Team, 2012;) and their understanding (Bholat et al., 2018; 2019). Looking at the nonprofessional’s knowledge of monetary policy and central banking and focusing on the link between the general public’s understanding and their approval of the BoE’s policies, Jost (2017) shows that the average British person has limited knowledge of central banking. The data reveal that satisfaction with the BoE’s policies increases with a better understanding of monetary policy. Similarly, knowledge of the ECB is a key determinant of people’s trust in the Bank. Hayo and Neuenkirch (2014) conducted a survey among a sample of the German population and showed that knowledge of monetary policy, and especially of the ECB, fosters trust in the ECB. Also, not only does better knowledge of the institution trigger greater levels of trust, but also, in the aftermath of the 2008 GFC, the decrease in trust among the public who had some knowledge of the ECB was less pronounced than for those without any prior knowledge of the ECB (Ehrmann et al., 2013). This erosion of trust in the ECB (Roth et al., 2012) can be related to the fact that central banks are associated with the financial system and are considered to be the guardians of financial stability (Healey, 2001).

There is a “twin deficit” problem (Haldane, 2017) comprised of an “understanding deficit” and a “trust deficit”. Knowledge has a statistically significant impact on satisfaction, which can be considered as a proxy for trust in the central bank. In turn, satisfaction has a statistically significant impact on the central bank’s credibility. The public tends to have a more positive view of a policy implemented if they have a better understanding of it (Huston, 2010; 2012). Financial literacy plays a key role in the understanding of central bank messages (Mellina and Schmidt, 2018). Notably, economic knowledge has a direct and significant effect on public opinion about many economic issues and may be the most critical factor determining public opinion on such issues, more important and more consistently influential than other personal characteristics like age or income (Walstad, 1997). Communication with the general public could help build trust in the ECB (Bergbauer et al., 2020). It thus appears that central banks would have a lot to gain by reaching out and connecting with a

³ European Central Bank (2021). Summary Report of the ECB Listens Portal, 8 February

wider public.

People who are financially literate are more likely to trust financial institutions (van der Crujjsen et al., 2019). Trust can be defined as “the belief or perception by one party (e.g. a principal) that the other party (e.g. an agent) to a particular transaction will not cheat, where the payoff structure internal to the transaction can be characterized by a prisoner’s dilemma or principal-agent game” (Knack, 2001). In our research, the principal is represented by the citizens and the agent is the central bank, i.e. the ECB: trust is defined as the belief that the ECB delivers on its goal, which is price stability, to citizens (Ehrmann et al., 2013). Trust is especially relevant in the case of central banks as they rely on announcements to steer expectations: it is impossible to believe in these announcements if one does not trust the institution making these announcements and sound levels of trust are very important as the general public do not see or monitor central banks’ activities. A study conducted by Christelis et al. (2020) shows that people with higher levels of trust in the ECB have lower inflation expectations and also have lower uncertainty about the future levels of inflation. So, in the case of central banks, financial literacy would make it easier to introduce better policies in a democratic process and thus lay the foundations for their effectiveness (Leiser and Krill, 2016): the reception of economic policy by the general public and how the latter understands inflation depend on how it grasps the situation and the causal forces at work. Trust in banks, for instance, is related to people’s subjective view of the state of the economy and whether or not they experienced a bank failure (Knell and Stix, 2015). Opaque product information or experiencing a bank failure can lead to declining levels of trust with greater concerns about bank bonuses (Jansen et al., 2015).

Given the lack of expertise among the general public in central banking but also the fact that most central banks have inflation targets, and ultimately, households and businesses are the ones setting the prices and production levels in the real economy, a strand of the literature has started studying how more accessible and relatable communication could be a way to anchor inflation expectations among the general public. Empirical evidence shows that communication geared towards a wider audience increases understanding of the central bank and this correlates with inflation expectation of households that are closer to the inflation targets of the central bank (Haldane and McMahon, 2018). The 3 E’s – Explanation, Engagement and Education – are key to connecting with the public and managing their inflation expectations (Haldane et al., 2020). More outreach appears to be useful for the quality of beliefs of the general public (Lamla and Vinogradov, 2019): the authors study the impact of the Federal Reserve Board (FED) communication on the general public and find a correlation between knowledge of the central bank and confidence in the central bank, and knowledgeable consumers also have smaller errors in perceived inflation (in regard to real inflation). The authors observe a significant gap in beliefs and confidence between informed and uninformed individuals: receiving news implies an 8% higher probability of being confident in their own beliefs. To

ensure increased coverage affects beliefs, communication should be done in such a way that it does not only inform but also makes people better understand the information they receive. Thus, successful communication is key both for the effectiveness of the central bank's monetary policy and to building public support for the institutional framework within which the monetary policy is implemented (Reid, 2015). Better communication as well as enhanced transparency could improve the effectiveness of central bank policies (Kohn, 2011).

Empirical evidence shows that not only can central bank communication with the general public help anchor their inflation expectations and thereby serve the effectiveness of monetary policy, but it can also fulfil a democratic demand for accountability. Social cohesion and trust influence the quality of public policies and thus influence ultimately the success of democracy (Putnam, 1993). More trust leads to a better functioning of public institutions: a certain level of citizens' trust in a policy-making institution is crucial for its legitimacy (Kosfeld et al., 2005; Kaltenthaler et al., 2010). Better communication is "important for reasons of political accountability, ensuring operationally independent central banks are meeting the terms of their social contract with wider society" (Haldane and McMahon, 2018). This suggests that behind these three concepts of understanding, trust and credibility, there is a common driving relationship and the three need each other, and communication is at the heart of this dynamic. It is essential that the general public understand and trust institutions such as central banks, as citizen understanding is key for democracy (Caplan, 2011; Davies, 2015). The effectiveness of monetary policy relies on reputation and credibility (Kydland and Prescott, 1977; Barro and Gordon, 1983). Ultimately, trust in the central bank is what guarantees consensus in a non-elected body and grants it freedom: it is the general public that give central banks their democratic legitimacy, build the central bank's accountability and enhance its independence. Good monetary policy or increased public accountability is essential to legitimising central bank independence (Issing, 1999). Communication, in the sense that it favours transparency, can also improve accountability (Geraats, 2002). Transparency thus allows double improvements: increased accountability and policy performance.

This thesis follows the works of Haldane and McMahon (2018) and Bholat et al. (2018; 2019) which focus on the BoE's communication. The former surveyed MPhil students at Oxford University and a representative sample of the UK population in 2017. The aim was to investigate the impact of the BoE's monetary policy communication on consumers' beliefs by focusing on the accessibility and readability of the message conveyed. They tested if participants had understood the content they read: some participants received the Visual Inflation Summary written in plain language and others received the traditional Inflation Report written in more technical language. Their results show that communication can contribute to building public understanding, which is important as a means of establishing trust and credibility about central banks and

their policies. Bholat et al. (2018; 2019) built on Haldane and McMahon's research and conducted an online survey to test the impact of simplified and relatable central bank messages on the general public's understanding of the Inflation Report of the BoE. They increased the sample size, included a "Relatable Summary" of the Inflation Report and a question testing direct comprehension, thereby complementing the self-reported questions in Haldane and McMahon's study.

This thesis builds on Haldane and McMahon's and Bholat et al.'s studies in several ways. We analyse the communication of the ECB to test the impact of the ECB's simplified and relatable communication and measure the marginal contribution of variations in the strategy and style of its communication on understanding of, and trust in, the central bank among the general public. For this purpose, we survey two different groups of students: a group familiar with economics (Economics students at the Sorbonne University) and another without specific knowledge of economics (Law, Social Sciences and Philosophy students at the Sorbonne University). Each participant is randomly assigned to either the simplified or the technical publication. We include a self-reported comprehension question as well as direct and applied comprehension questions. Also, we include a within-subject experiment design to get a sense of how much the participants knew about the ECB and inflation before receiving the treatment. This is a major improvement relative to Bholat et al.'s study as it allows us to know whether the participants actually learned something new from reading the publications, and if so, which publication contributed more. We also include additional questions related to trust in the ECB.

Section 3: Methodology

The aim of our randomised controlled trial is to test and measure the way changes in the ECB's communication on its policy response to the coronavirus pandemic affect comprehension of, and trust in, the ECB's policy messages on the PEPP among the general public.

We surveyed two different groups: one consisted of 81 third-year Bachelor's in Economics students at the Sorbonne University in Paris, while the second group was made up of 53 students of Law, Social Sciences and Philosophy, also from the Sorbonne University. Participants in both groups were randomly assigned to the simplified version of an ECB publication on the PEPP (treatment group) or the technical excerpt (control group). The aim was to evaluate the effect of simplified and relatable language on understanding of, and trust in, the ECB. We expect a positive effect of the ECB's simplified and relatable communication on understanding of, and trust in, the central bank, especially in the group of non-economists, as well as a positive although possibly lower effect in the group of economists.

Communication measure

Monetary Policy decisions: our control condition was the Monetary Policy decisions press release published on 10 December 2020 which focused on the PEPP. This is one of the press releases which are always published at 13:45 CET on ECB press conference days. It is destined to a specialised public – analysts and journalists – awaiting the monetary policy decisions.

Coronavirus hub page: the treatment group received a simplified text version of the messages contained in the Monetary Policy decisions press release about the PEPP. This version was created by the ECB's team with the aim of making some of the ECB's key communications more relatable to a wider public.

Different techniques were used to make the *Coronavirus hub page* text more relatable. First of all, the first-person plural pronoun (“e.g. we”) was used instead of the third-person singular pronoun which is more abstract (e.g. “The European Central Bank” and “The Governing Council”). While the *Monetary Policy decisions* stated, “The Governing Council expects the key ECB interest rates to remain at their present or lower levels”, the *Coronavirus hub page* read “We have kept our key interest rates at historically low levels so borrowing costs remain low”. Moreover, the simplified text included everyday words which are relatable to people, such as “citizens, firms and governments” and “boost spending and investment”, instead of “sectors of the economy” and “favourable financing conditions”. Also, the simplified text contained fewer words. Table 1 shows the word count and readability of the two experimental conditions. Annex 1 contains the survey material.

Table 1: The word count and readability of the two experimental conditions

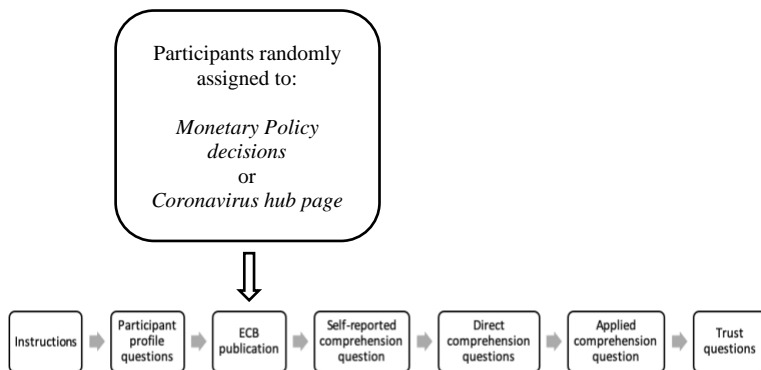
Condition	Word count	Flesch-Kincaid grade level	Automated readability index	Gunning Fog index	SMOG index
Monetary Policy decisions	362	19,4	20,2	24,6	17,5
Coronavirus hub page	256	15,6	16,4	18,7	13,6

Source: Adapted from Bholat et al. (2018)

Stages of the experiment

Participants went through different stages in the survey (Figure 2). Each step is described in order below, together with the expected responses based on the existing literature.

Figure 2: The stages of the experiment



Source: Adapted from Bholat et al. (2018)

- Participant profile questions:** the aim was to obtain individual characteristics such as gender, age, field of study, habits on the participants' ways of accessing the news and the extent to which they are interested in economic news. We expect that knowledge of economics and understanding of the ECB's communications are positively correlated, as financial literacy is key for understanding (Mellina and Schmidt, 2018) and economic knowledge is one of the most important factors that shape public opinion on economic topics

(Walstad, 1997). Economics students are used as a proxy for a specialised audience in economics. Thus, we expect economics students to score better than non-economics students in the comprehension questions overall and the gap in scores between economists and non-economists to be wider in the case of the technical version of the publication than for the simplified version.

- **Knowledge of the ECB and inflation questions:** these questions asked whether participants know who the President of the ECB is, if they know what the ECB's role is and if they are aware of the levels of inflation in France for 2020. The aim was to know the effect of prior knowledge of the ECB and inflation on understanding of the ECB's communications. It was also a way to understand if survey participants actually learned something from reading the texts: we set up a within-subject experiment design to present a before and after evaluation of understanding. If they knew nothing before and then got answers about the ECB's communications right, we considered it to be a success. Following empirical evidence that knowledge of economic topics enhances understanding and trust in financial institutions (van der Cruijssen et al., 2019) and specifically that knowledge of the ECB is a key determinant of people's trust in the institution (Ehrmann et al., 2013), we expect that participants who know who the ECB President is and are aware of the ECB's role and of inflation, will score better in comprehension questions and tend to express greater trust in the ECB.
- **Self-reported comprehension question:** the aim was to see the extent to which participants felt they understood the publication they were presented with. Participants could answer on a scale from 1 to 5; 5 meaning they felt they understood all of the content. We expect that the simplified publication will lead to higher self-reported comprehension scores on average compared to the technical version as we expect it to be easier for participants to relate to the simplified version. Specifically, we expect a greater effect of the simplified version on self-reported comprehension scores among the sample of non-economists, building on studies showing that breaking down complex content on central banking can make the content more relatable and thus contribute to higher comprehension scores especially among laypeople (Haldane and McMahon, 2018).
- **Direct comprehension questions:** we completed the self-reported comprehension question with direct comprehension questions as previous studies show that respondents tend to overestimate their understanding (Galizzi and Navarro-Martinez, 2017); moreover, Loewenstein et al. (2013) go further in saying that the two types of questions may actually not be so correlated. For all three direct comprehension questions, asking participants why the ECB is keeping

interest rates low, what the aim of the PEPP is, and to select the true statement about the PEPP, we expect that the *Coronavirus hub page* will lead to improvements in understanding among the public. Indeed, research shows that more accessible and relevant information improves engagement and understanding of the content (Garner, 2005; Perry and Bumenthal, 2012; Behavioural Insights Team, 2012; Bholat et al., 2018; 2019; Haldane and McMahon, 2018).

- **Applied comprehension question:** we included a question on the aim of the ECB's monetary policy. We expect a greater effect of knowledge of economics over other factors in this question as the answer is not explicitly given in the *Coronavirus hub page*: to answer it correctly would require familiarity with economics. Also, Bholat et al. (2018; 2019) showed that participants scored extremely poorly in applied comprehension questions.
- **Trust questions:** the aim was to test the effect of the treatment on the participants' levels of trust in the ECB. We hypothesise that as the subjects of the experiment were randomised, trust levels before the treatment should be on average similar across individuals. This way, we consider that the differences in trust levels observed at the end of the experience reflect the effect of the treatment, i.e. receiving the technical or simplified communication. We included several questions to have different indicators of trust. We asked:
 - *How the content affected participants' perceptions of the ECB:* we expect that the *Coronavirus hub page* will lead to reports of improved perceptions of the ECB which are higher than for the *Monetary Policy decisions*, as existing studies show that better understanding of the central bank's communication increases people's satisfaction in the central bank (Bholat et al., 2018; 2019; Haldane and McMahon, 2018; Jost, 2017). People also have a more positive view of a policy when they understand it better (Huston, 2010; 2012).
 - *To what extent do participants trust the ECB:* we expect that trust in the ECB will be positively associated with participants' interest in economic news and knowledge of the ECB, following existing empirical evidence that satisfaction in a central bank's policy is determined by people's knowledge of economic and central bank topics (Jost, 2017) and that knowledge of the ECB is a key determinant of trust in the institution (Ehrmann et al., 2013).
 - *If participants would recommend the content:* we expect that participants will recommend the content more often

when they read the *Coronavirus hub page* compared to the *Monetary Policy decisions*, as empirical evidence shows that people relate to and engage more with the content when it is more accessible (Garner, 2005; Perry and Bumenthal, 2012; Behavioural Insights Team, 2012).

- *If the content changed participants' views or expectations on the outlook for the economy:*

we expect more participants to report positive changes in their expectations of the outlook for the economy when they read the *Coronavirus hub page*, as the content is more accessible and relatable.

Table 2: The survey questions

Questions asked of participants	
Correct answers are underlined>, where applicable	
Participant profile questions	
1.	What is your gender? a. Female b. Male c. Other d. Prefer not to say
2.	Your age category: a. 18-20 b. 21-23 c. 24 or above d. Prefer not to say
3.	On a scale from 1-5, how interested are you in economic news? (1: A little; 5: A lot) a. 1 b. 2 c. 3 d. 4 e. 5
4.	Where do you get most of your news? a. In newspapers b. In online newspapers c. On television d. On social media e. By listening to podcasts f. On the radio g. On forums
5.	What are you studying? a. Economics b. Law c. Other

<p>Knowledge of the ECB questions</p> <p>6. What is the role of the European Central Bank?</p> <ul style="list-style-type: none">a. To provide financial support to failing banks in Europeb. <u>To keep prices stable in the eurozone</u>c. To set the value of the euro in relation to other currenciesd. Don't know <p>7. Who is the current head of the European Central Bank?</p> <ul style="list-style-type: none">a. Ursula von der Leyenb. Mario Draghic. <u>Christine Lagarde</u>d. Don't know
<p>Inflation question</p> <p>8. What was the approximate inflation rate in France in 2020?</p> <ul style="list-style-type: none">a. 7%b. 2%c. <u>0.5%</u>d. Don't know
<p>Self-reported comprehension question</p> <p>9. On a scale from 1-5, to what extent are you able to understand the content and messages of the material you just read? (1: None of it; 5: All of it)</p> <ul style="list-style-type: none">a. 1b. 2c. 3d. 4e. 5
<p>Direct comprehension questions</p> <p>10. Based on what you have read, why is the European Central keeping interest rates low?</p> <ul style="list-style-type: none">a. To help banks give credits to all European citizensb. To increase inflation in the eurozonec. <u>To keep supporting credit flows for people and businesses in the eurozone</u>d. Don't know <p>11. Based on what you have read, which of these statements is true about the Pandemic Emergency Purchase Programme?</p> <ul style="list-style-type: none">a. It consists in selling private and public sector bondsb. <u>It consists in buying bonds from banks and businesses</u>c. It contributes to protecting banksd. Don't know <p>12. Based on what you have read, what is the aim of the Pandemic Emergency Purchase Programme?</p> <ul style="list-style-type: none">a. To raise interest rates in the eurozoneb. <u>To increase investment and growth in the eurozone</u>c. To lower bank lending in the eurozoned. Don't know
<p>Applied comprehension question</p>

13. Based on what you have read, what is the purpose of the monetary policy conducted by the European Central Bank?
- To help finance banks in the eurozone
 - To keep inflation levels steady and support economic growth in the eurozone
 - To ensure the euro's value doesn't increase too rapidly compared to other currencies
 - Don't know

Trust questions

14. How has the content you have just read affected your perceptions of the European Central Bank (ECB)?
- It positively affected how I perceive the ECB
 - It negatively affected how I perceive the ECB
 - It didn't affect how I perceive the ECB
15. Would you recommend the content you have just read to someone who is looking for trustworthy information on the economy?
- Yes
 - No
16. On a scale from 1-5, to what extent do you trust the European Central Bank? (1: I don't trust it; 5: I totally trust it)
- 1
 - 2
 - 3
 - 4
 - 5
17. How has reading this excerpt changed your views or expectations on the outlook for the economy?
- It affected my views and expectations positively
 - It affected my views and expectations negatively
 - It didn't affect my views or expectations

Note Table 2: The questions were originally phrased in French. This translation attempts to reflect all the nuances of the original version. See Annex 2 for French version.

Sampling strategy

The experiment was conducted online on the LimeSurvey platform in April 2021 and was completed by 134 respondents. The survey was anonymous: each participant was assigned the number reflecting the order in which they did the survey: for example, participant number 1 was the first person to take the survey, whereas participant number 45 was the forty-fifth person to take it. No personal information on the participants was gathered during this survey.

Participants in both groups received either the *Monetary policy decisions* or the *Coronavirus hub page*. There was no time limit for completing the survey. The participants were not informed of the purpose of the experiment – they only knew that it was on central banks and the general public. They did not know that there were two different versions of the ECB publication which

were shown randomly and tested in this experiment. Participants were free to participate or not and could exit the survey at any time. They did not receive any financial compensation nor bonuses on their grades for participating in this survey. The distribution of the demographic categories across the realised sample is shown in Table 3.

Table 3: Distribution of demographic categories across the sample

Demographic	Sub-group	Sample
Age	18-20	42,54%
	21-23	48,51%
	24+	8,96%
Gender	Female	50%
	Male	49,25%
	Other	0,75%
Economic engagement	Yes (participant ranks their interest in economic news between 4-5)	63,43%
	No (participant ranks their interest in economic news between 1-3)	36,57%
Economics degree	Yes	60,45%
	No	39,55%
News source	Digital (online newspapers, social media, podcast)	83,58%
	Traditional (television, radio, newspapers)	16,42%

N = 134

Source: author

The completion rate of the survey was 60,08% overall. The completion rate for the *Coronavirus hub page* was four percentage points higher than that of the *Monetary Policy decisions* (Table 4). In particular, the drop-out rate which occurred exactly at the question showing the publication is slightly higher for the technical version than for the simplified version: 11% of participants who had been assigned to the technical version dropped out when seeing the text, whereas 9% dropped out when seeing the simplified version. This indicates that as the *Monetary Policy decisions* contains more text and is more technical, participants were discouraged from reading it and pursuing the survey. Also, the drop-out rate is higher among non-economists.

Furthermore, our results show that women tend to drop out more frequently than men when faced with either publication: they are approximately four times more likely to quit the survey (12,65% versus 3,75%). This gender gap appears to be commonly found in financial literacy studies, and one possible explanation is women's lack of interest in financial topics (Hung et al., 2012): as

women may be less familiar with economic content, they would consequently be more easily discouraged than men when confronted with a publication on the topic.

Table 4: Completion rates across treatments of the experiment

Condition	Started	Completed	Completion rate
Monetary Policy decisions	107	62	57,94%
Coronavirus hub page	116	72	62,06%
TOTAL	223	134	60,08%

N = 223

Source: author

Modelling approach and variables of interest

Our first variables of interest were the participants' responses to the direct comprehension questions, in particular the questions on the true statement about the PEPP and the aim of the PEPP. In the regression model, we compared the treatment condition (*Coronavirus hub page*) against the control condition (*Monetary Policy decisions*). T_i is the dummy variable equal to 1 if participant i is assigned to the simplified version and 0 otherwise. We were also interested to see the effect of prior knowledge of the ECB's role, awareness of who the ECB President is and knowledge of inflation on participants' scores in these questions. These knowledge variables are included in K_i . To do so, we ran ordinary least squares (OLS) regressions and logistic regressions with robust against heteroskedasticity standard errors. We included a vector of controls (A_i): we controlled for gender, the course in which participants are enrolled, economic engagement and news sources.

$$Y_i^{comp} = \beta_0 + \beta_1 T_i + \beta_2 K_i + \beta_3 A_i + \varepsilon_i$$

Our second variable of interest was the participants' answers to the questions on trust. We ran similar OLS and logistic regressions as above, changing the dependent variable: we were particularly interested to see the determinants of trust in the ECB and changes in perceptions of the ECB following the treatment.

$$Y_i^{trust} = \beta_0 + \beta_1 T_i + \beta_2 K_i + \beta_3 A_i + \varepsilon_i$$

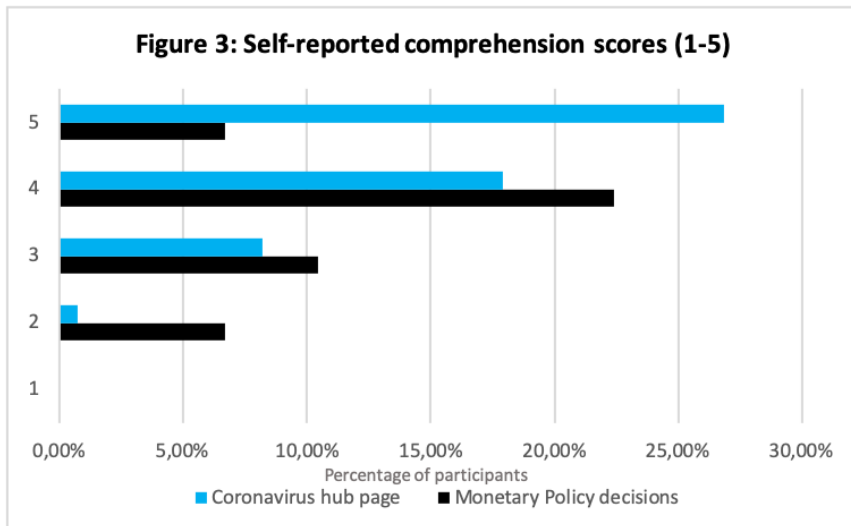
We ran the models for the whole sample and separately for the group of economists and the group of non-economists. Annex 3 includes further information on our regression models.

Section 4: Results

Descriptive statistics

- **Treatment and comprehension scores**

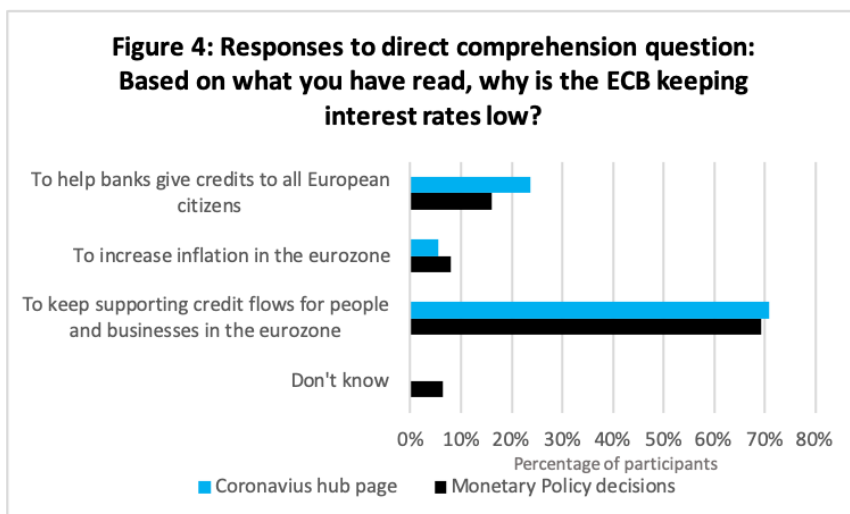
Our results indicate that the *Monetary Policy decisions* was perceived as more technical than the *Coronavirus hub page*, both by economists and non-economists. Participants were given the opportunity to self-evaluate their understanding of the content they had read on a scale from 1 to 5, where 1 was “None of it” and 5 was “All of it”. While a little over a quarter of participants who read the simplified version rated their understanding at 5, they were only approximately 6% to do so for the technical version (Figure 3). Symmetrically, more people gave a score of 2 for the *Monetary Policy decisions* than for the *Coronavirus hub page*. The average self-reported comprehension score is higher for the *Coronavirus hub page* both among economists and non-economists. More specifically, while no economist rated their understanding under 3 points out of 5 for the *Coronavirus hub page*, some did when they were assigned to the *Monetary Policy decisions*. No participant among non-economists rated their self-comprehension of the *Monetary Policy decisions* at a maximum of 5 points, while some did for the *Coronavirus hub page*. All these findings indicate that the *Monetary Policy decisions* was perceived as being too technical for participants to feel that the content was fully understood.



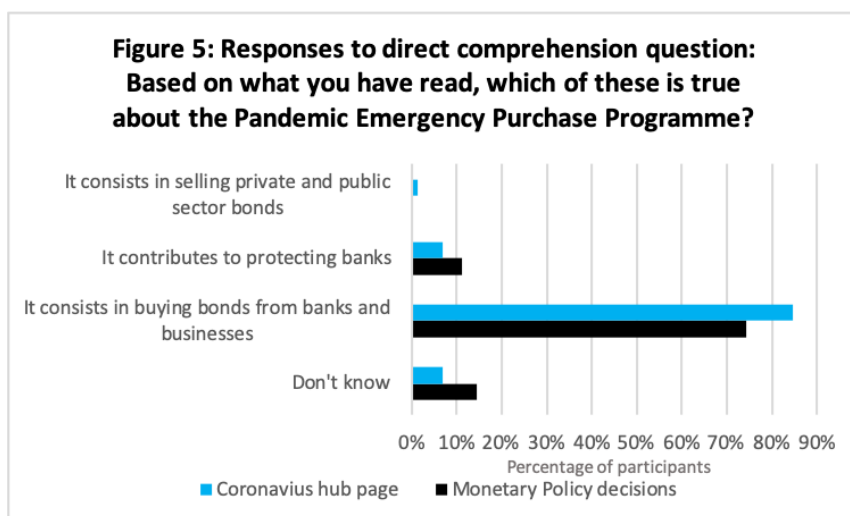
Source: author

The direct comprehension scores are in line with participants’ self-reported comprehension. Figures 4, 5 and 6 present participants’ responses to each direct comprehension question across both conditions. Overall, our results

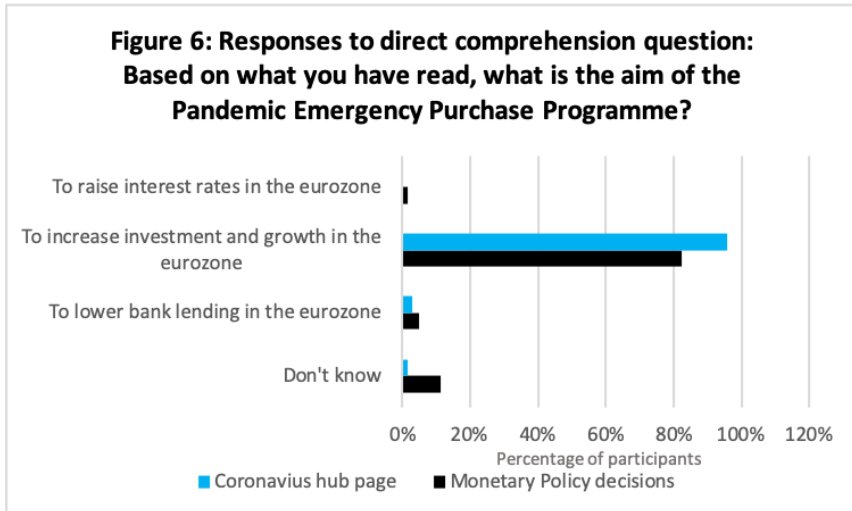
show that comprehension scores were on average slightly higher for the *Coronavirus hub page* relative to the *Monetary Policy decisions*, both among economists and non-economists.



Source: author



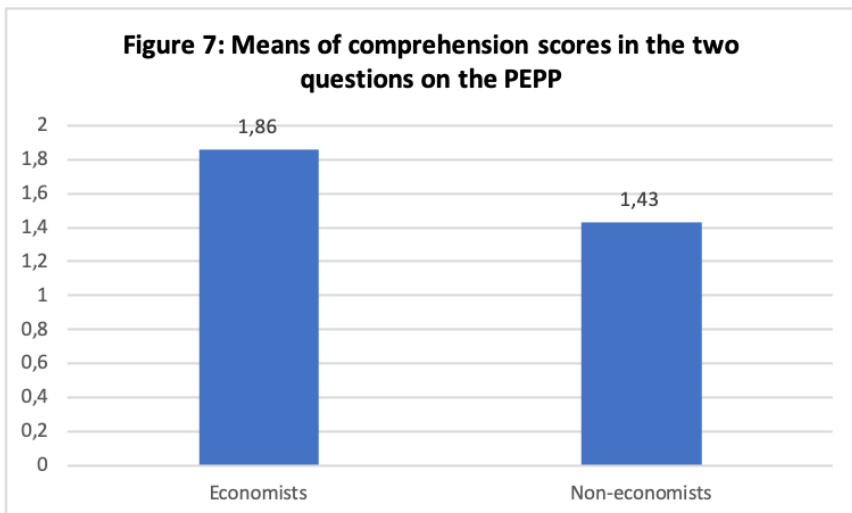
Source: author



Source: author

- **Knowledge of economics and comprehension scores**

As expected, knowledge of economics is associated with higher comprehension scores and the difference in comprehension scores between economists and non-economists is higher for the *Monetary Policy decisions*. The difference in comprehension scores of 0.43 points (23.1%) between economists and non-economists (Figure 7) indicates that knowledge of economics plays a role in comprehension of the ECB’s communications. These findings fit with the argument of Mellina and Schmidt (2018) according to which financial literacy is crucial in order to understand central bank communication.



Source: author

- **Prior knowledge of the ECB and inflation and comprehension scores**

Unsurprisingly, our overall results show that prior knowledge of the ECB and inflation is associated with a better understanding of the ECB's communications. Our data also show that participants without prior knowledge of the ECB score better when assigned to the *Coronavirus hub page* rather than when they read the *Monetary Policy decisions*.

Our results confirm that knowledge of the ECB can play a role in understanding of the institution's communications. As expected, participants who did not know who the ECB President is scored lower in the comprehension questions. The question asking participants who the current head of the ECB is was the one that was answered most correctly by participants: 121 participants out of 134 got the question right. Among the 13 participants who did not know who the President of the ECB is, none of them got all of the four comprehension questions right, and two-thirds scored between zero and two answers right. There were only two economists among these 13 participants.

Once again, unsurprisingly, our results show that knowledge of the ECB's role plays a role in comprehension of the Bank's communications: 83% of participants who knew the ECB's role before taking the survey got either three or all four comprehension questions right. None of them got more than one answer wrong. Furthermore, our within-subject experiment design allows us to see that people who did not know anything about the ECB scored better when assigned to the simplified publication rather than the technical publication. Among the 15 people who did not know about the ECB's role and were assigned to the simplified version, 12 people got either 3 or 4 answers right. For the technical version, 8 out of 13 participants got either 3 or 4 answers right out of all comprehension questions.

Among those who got the inflation question right, none of them got all the answers wrong, which happened when participants did not get the inflation question right. Also, those who got the inflation question right were 57% to get all comprehension questions right, compared to 37% among those who got the inflation question wrong. As expected, there was a difference in scores between economists and non-economists. While 64% of economists got the answer right, 45% of non-economics students answered the question correctly.

Regression analysis

We conducted several regressions to evaluate the impact of the simplified and relatable communication on understanding and trust in the ECB's communications.

- **The impact of the two publications on understanding**

Overall, our results show that simplified and relatable communication by the ECB can help build understanding of the content among the general public. These findings fit with the existing literature which shows that accessible and relevant content improves understanding (Garner, 2005; Perry and Bumenthal, 2012; Behavioural Insights Team, 2012).

Table 5 shows our results for the two comprehension questions on the PEPP. Participants who receive the *Coronavirus hub page* score better at the two comprehension questions on the PEPP than those who view the *Monetary Policy decisions*. The *Coronavirus hub page* leads to a statistically significant improvement by 13% (0.20 points) in comprehension scores on the PEPP on average, in the sample including both economists and non-economists (Table 5; Column 1). Specifically, among non-economists, the treatment has an even greater effect: it contributes to increasing the score in the comprehension questions on the PEPP by 0.43 points (Table 5; Column 2). This means that the simplified version of the publication increases non-economists' score by 36% overall in the questions asking about their understanding of the ECB's communications on the PEPP.

We asked participants about the aim of the PEPP based on what they had read. Overall, our results show that the simplified version enhances participants' understanding of the content. The treatment has a positive and statistically significant effect on comprehension of the aim of the PEPP: the participants who receive the *Coronavirus hub page* score 9% higher relative to the *Monetary Policy decisions* (Annex 6).

We also asked participants to select the true statement about the PEPP based on the content they had read. Our results indicate that the *Coronavirus hub page* improves understanding among non-economists: it leads to a positive and statistically significant increase in their comprehension scores in this question by 33% (Annex 6). Among economists, our results do not show a statistically significant effect of the simplified version on the answers to this question.

Regarding the third direct comprehension question, overall our results do not show a statistically significant effect of the treatment on participants' understanding of the reason why the ECB is keeping interest rates low (Annex 6).

Overall, our findings regarding the effect of the treatment on

understanding the ECB’s communications on the PEPP show that simplified communication on complex topics like the PEPP can positively and significantly impact people’s understanding of the content. They confirm that the ECB’s efforts to reach a wider public are not in vain. Our findings show that simplified and relatable communication can especially help build understanding of central bank messages among a population who is not familiar with economics.

Table 5: Regression results for comprehension questions on the PEPP

	Dependent variable		
	Comprehension of the PEPP (0-2)		
	OLS		
	(1)	(2)	(3)
Coronavirus hub page	0.204** (0.082)	0.434** (0.170)	0.082 (0.080)
Economics	0.290*** (0.111)		
Knowledge of ECB President	0.508** (0.388)	0.546** (0.229)	0.211 (0.256)
Knowledge of inflation	0.369*** (0.106)	0.683*** (0.183)	0.044 (0.095)
Knowledge of ECB role	0.021 (0.132)	0.106 (0.214)	0.00002 (0.121)
Digital news source	0.027 (0.036)	0.012 (0.076)	0.021 (0.029)
Interest in economic news	-0.036 (0.060)	-0.160* (0.089)	0.065 (0.048)
Female	0.054 (0.096)	0.148 (0.178)	-0.136 (0.085)
Constant	0.701** (0.521)	0.765* (0.423)	1.270*** (0.368)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.339	0.457	0.115
Adjusted R ²	0.297	0.373	0.030
Residual Std. Error	0.485 (df = 125)	0.592 (df = 45)	0.340 (df = 73)
F Statistic	8.019*** (df = 8; 125)	5.413*** (df = 7; 45)	1.352 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

As a follow-up to the direct comprehension questions, we asked participants what the purpose of the ECB’s monetary policy is. The *Coronavirus hub page* does not have a statistically significant effect among economists or

non-economists for this applied comprehension question (Annex 7). However, quite surprisingly, the treatment seems to have a negative effect among the sample as a whole. An explanation could be that the answer to this question was mentioned in the technical version, while it was not the point of the simplified version, which focused exclusively on the PEPP. In this sense, this result may be due to the fact that the question could have favoured the technical version. It indicates the importance of focusing on a clear central message when communicating with the general public. It is interesting to note that Bholat et al. (2018) also found very low levels of applied comprehension in their study.

Besides the direct and applied comprehension questions, we were also interested to see participants' self-reported comprehension levels. We asked participants to rate the extent to which they understood the publication they had read. Table 6 reports our results. Overall, our findings show that simplified and relatable communication is successful in improving the way people feel they understand the content. Using more colloquial language and breaking down complex economic concepts make the content more accessible for a wider public and enhance their understanding of complex topics like the ECB's policy. Such simplified communication also appears to improve economists' self-reported comprehension scores, indicating that simplified and relatable communication by central banks can be beneficial not only to laypeople but also to those who are already familiar with economic topics. These improvements in self-reported comprehension follow the same pattern as the direct comprehension questions.

More specifically, our findings show that the *Coronavirus hub page* leads to a statistically significant improvement by 0.67 points out of 5 in self-reported comprehension scores in the overall sample (Table 6, Column 1), which is in line with the findings of Bholat et al. (2018; 2019). In other words, the simplified version of the publication increases self-reported comprehension scores by 18% overall. Specifically, among non-economists, the *Coronavirus hub page* leads to an even greater positive effect, which is also statistically significant: the simplified version improves self-reported comprehension scores by 26% (0.85 points out of 5) (Table 6, Column 2). Interestingly, the simplified version also leads to a positive and statistically significant increase in self-reported comprehension scores in the group of economists, by 15% (0.61 points) (Table 6, Column 3). This positive effect among the group of economists is similar to the results of Haldane and McMahon (2018). These findings confirm that simplified and relatable communication by the central bank is not only beneficial to non-experts but also to people who are familiar with economics.

- **The impact of economic knowledge and engagement on understanding**

Let us now turn to the impact of economic knowledge and engagement on participants' understanding of the content.

The results of our survey show, unsurprisingly, that the percentage of participants who score higher in the comprehension questions is greater among economists than non-economists. Studying economics has a positive and

statistically significant effect on comprehension of the PEPP: economics students score 0.29 points higher than non-economists in the two direct questions on the PEPP (Table 5; Column 1). This means that studying economics leads to a 25% increase in the comprehension scores for the two questions on the PEPP.

Table 6: Regression results for self-reported comprehension question

	Dependent variable		
	Self-reported comprehension (1-5)		
	OLS		
	(1)	(2)	(3)
Coronavirus hub page	0.677*** (0.161)	0.855*** (0.214)	0.617*** (0.172)
Economics degree	0.123 (0.147)		
Knowledge of ECB President	0.429 (0.737)	0.387 (0.288)	0.695 (0.548)
Knowledge of inflation	0.316** (0.208)	0.397* (0.230)	0.226 (0.204)
Knowledge of ECB role	-0.018 (0.216)	0.291 (0.269)	-0.185 (0.259)
Digital news source	0.006 (0.064)	-0.097 (0.095)	0.048 (0.063)
Interest in economic news	0.285*** (0.095)	0.194* (0.111)	0.348*** (0.103)
Female	0.044 (0.177)	-0.092 (0.223)	0.089 (0.181)
Constant	1.886*** (0.916)	2.442*** (0.531)	1.500* (0.789)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.392	0.477	0.277
Adjusted R ²	0.353	0.396	0.208
Residual Std. Error	0.731 (df = 125)	0.743 (df = 45)	0.727 (df = 73)
F Statistic	10.082*** (df = 8; 125)	5.875*** (df = 7; 45)	3.995*** (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

Also, economic engagement – which we measure with participants’ degree of interest in economic news – is positively associated with participants’ self-reported comprehension scores, both among economists and non-economists, as shown by the positive and statistically significant coefficients in

Table 6. These results can be interpreted in light of the rational inattention literature (Sims, 2003; 2005; 2010), according to which people have a limited capacity to receive and process information, so they are reluctant to acquire any information that is difficult to process. Here, as it is less costly for people who have an interest in economic news to process the information on central banking, they can relate and understand the content better. This also goes in the direction of existing evidence that rational inattention is very pronounced concerning central bank topics (Carvalho and Nechio, 2014; Dräger et al., 2015). Simplified central bank communication can limit this inattention (Candia et al., 2020).

- **The impact of prior knowledge of the ECB and inflation on understanding**

We included in our survey a within-subject experiment design by adding questions at the start of the survey to get a sense of how well people knew the ECB prior to taking the experiment. This within-subject experiment design was not included in the studies of Bholat et al. (2018; 2019) nor of Haldane and McMahan (2018). It aims to evaluate further the role of knowledge of the central bank in fostering comprehension also so as to limit any bias when measuring the impact of the simplified publication on understanding, as we can control for prior knowledge of the ECB and inflation.

Our results indicate, as expected, that participants who know about the ECB and/or inflation understand better the ECB's communications compared to the other participants.

First of all, overall, the participants who answer correctly the question asking who the ECB President is score 1.17 points higher in the comprehension questions (Annex 4). This statistically significant effect is more pronounced among non-economists (1.19 points), showing that exposure to the ECB via its President in the media can contribute to a better understanding of the ECB's communications. It also points to the relevance of leveraging further President Lagarde's social media channels to share relatable information about the ECB's key policy decisions so as to build awareness and understanding of the institution among an audience less familiar with economics.

Specifically, for the two comprehension questions on the PEPP, participants who know who the ECB President is score on average 0.50 points higher (Table 5; Column 1). The effect is higher (0.54 points) among non-economists. An interpretation of this greater effect among non-economists could be that the general public has been receptive to President Lagarde's public appearances in the media in which she spoke about the aim of the PEPP. The effect is also positive and significant for the question asking why the ECB is keeping interest rates low: those who know who the ECB President is score 55% higher in this question (Annex 6). Overall, in the three direct comprehension questions, participants who know who the ECB President is score 1.05 points higher than the other participants (Annex 5).

Also, our results show that knowledge of inflation is positively associated with participants' comprehension scores. Participants who answer the question on inflation correctly score on average 0.45 points higher in the comprehension questions overall (Annex 4), and 0.31 points higher in the direct comprehension questions (Annex 5). Specifically, for the two questions on the PEPP, the effect of knowledge of inflation is of 0.36 points (Table 5; Column 1).

- **The impact of the two publications on trust**

We included several questions in the survey to have various indicators of trust in our analysis.

Overall, among non-economists, the *Coronavirus hub page* has a positive and statistically significant effect on overall trust (an aggregate indicator of participants' responses to the trust questions). Non-economists who read the simplified version score on average 0.62 points higher in the questions on trust than those who are assigned to the technical version (Annex 8). These findings indicate that more relatable communication by the central bank can foster trust in the institution among a public who is not familiar with economics. Furthermore, it appears that non-economists who report accessing most of their news on digital platforms (either on the web or on social media) tend to have less trust overall: the coefficient is negative and statistically significant (-0.28 points). This could be due to the high amount of misinformation – i.e. misleading information with or without deliberate intent of manipulation – which circulates on social media. This is all the more important as research shows that social media users are more likely to believe false information: Bridgman et al. (2020) show that social media is associated with misperceptions on the Covid-19 pandemic, which is not the case with more traditional news media. Our findings could also reflect the fact that central banks, in this case the ECB, have historically a higher share of voice in traditional media and less presence on social media. Our results also show that women tend to express more trust in the ECB, as shown by the positive and statistically significant coefficient of “Female” (0.55 points).

We asked participants if the content they read had affected their perceptions of the ECB. Participants could answer, “It negatively affected how I perceive the ECB”, “It didn't affect how I perceive the ECB” or “It positively affected how I perceive the ECB”, coded, in order, from 1 to 3. While in both conditions the average score is 2, meaning the content does not affect how participants perceive the ECB, a greater number of participants who read the *Coronavirus hub page* say that the content affects their perceptions of the ECB positively.

Specifically, among non-economists, our results show that participants are more likely to report improvements in their perceptions of the ECB when they read the *Coronavirus hub page*. Table 7 reports our results. It shows that participants who are not enrolled in an economics course are 14% (0.30 points)

more likely to report improvements in their perceptions of the ECB when they read the simplified publication. This statistically significant effect corresponds to the findings of Bholat et al. (2018; 2019) who found a positive and statistically significant effect of the Relatable Inflation summary report of 0.28 points on perceptions of the BoE. Our findings also fit with the literature which highlights that people have a more positive view of a policy when they understand it better (Huston, 2010; 2012). Also, among non-economists, the fact of knowing who holds the position of ECB President is associated with reports of positive changes in perceptions of the ECB, as shown by the coefficient (Table 7; Column 2). These results are in line with the literature pointing to the fact that a better understanding of monetary policy increases people's satisfaction with the central bank (Jost, 2017; Haldane and McMahon, 2018). Similar to the trend observed in overall trust, our results indicate that participants are less likely to say that the content has affected their views positively when they access most of their news on digital platforms.

Similarly, we asked "How has reading this excerpt changed your views or expectations on the outlook for the economy?". The answer options were, "It affected my views and expectations negatively", "It didn't affect my views or expectations" or "It affected my views and expectations positively", coded, in order, from 1 to 3. The average answer for this question is roughly 2, so the content does not affect participants' views or their expectations on average. Overall, the treatment does not have a statistically significant effect on participants' views or expectations on the outlook for the economy (Annex 9). Our results also show that women are more likely to report that the excerpt has changed their views or expectations on the outlook for the economy.

In our attempt to evaluate participants' trust in the ECB given the excerpt they had just read, we also asked "Would you recommend the content you have just read to someone who is looking for trustworthy information on the economy?". Participants had the choice between answering "Yes" or "No" (coded respectively 1 and 0). While there is no statistically significant effect of the treatment on the recommendation made by participants, it is interesting to note that the share of respondents who answer "Yes" is slightly higher for the *Coronavirus hub page* compared to the *Monetary Policy decisions* (86% versus 83%). Overall, the fact that a vast majority of respondents stated that they would recommend the content indicates a high amount of trust in the ECB's publications. Also, along the same trend we observed in the question on the outlook for the economy, women are more likely than men to recommend the content (Annex 10).

Table 7: Regression results for perceptions of the European Central Bank question

	Dependent variable		
	Perceptions of the European Central Bank (1-3)		
	OLS		
	(1)	(2)	(3)
Coronavirus hub page	0.001 (0.070)	0.306** (0.121)	-0.147* (0.086)
Economics degree	-0.014 (0.087)		
Knowledge of ECB President	0.080 (0.139)	0.228* (0.121)	-0.252 (0.407)
Knowledge of inflation	0.028 (0.089)	0.025 (0.142)	-0.043 (0.105)
Knowledge of ECB role	0.107 (0.097)	0.129 (0.141)	0.106 (0.123)
Digital news source	-0.025 (0.026)	-0.125*** (0.044)	-0.012 (0.035)
Interest in economic news	-0.095** (0.040)	-0.105** (0.048)	-0.105* (0.061)
Female	-0.004 (0.080)	-0.004 (0.139)	-0.050 (0.088)
Constant	2.464*** (0.205)	2.678*** (0.275)	2.898*** (0.520)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.060	0.236	0.108
Adjusted R ²	0.0002	0.117	0.022
Residual Std. Error	0.397 (df = 125)	0.414 (df = 45)	0.363 (df = 73)
F Statistic	1.004 (df = 8; 125)	1.985* (df = 7; 45)	1.259 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

Last but not least, we also included a question asking directly the extent to which participants trust the ECB. We asked participants “On a scale from 1-5, to what extent do you trust the European Central Bank?”, where a ranking of 5 meant they completely trusted the Bank. Table 8 reports our results. While quite surprisingly, economics students score on average 0.31 points less than non-economists in this question, overall, interest in economic news and knowledge of who the ECB President is are positively associated with trust in the ECB. These results fit with the findings of Jost (2017) which show that knowledge of economics and central banking is positively associated with people’s satisfaction with the BoE, and those of Ehrmann et al. (2013) which

show that knowledge of the ECB is a key determinant of trust in the central bank.

Table 8: Regression results for trust in the European Central Bank question

	Dependent variable		
	Trust in the ECB (1-5)		
	(1)	(2)	(3)
Coronavirus hub page	-0.145 (0.148)	0.103 (0.214)	-0.334 (0.211)
Economics degree	-0.311* (0.163)		
Knowledge of ECB President	0.322* (0.186)	0.139 (0.180)	0.937*** (0.252)
Knowledge of inflation	-0.167 (0.184)	0.093 (0.297)	-0.366 (0.263)
Knowledge of ECB role	0.134 (0.215)	0.423 (0.302)	0.013 (0.320)
Digital news source	-0.016 (0.051)	-0.122 (0.084)	0.016 (0.073)
Interest in economic news	0.192** (0.084)	0.197* (0.104)	0.138 (0.132)
Female	0.240 (0.150)	0.007 (0.202)	0.353* (0.212)
Constant	2.807*** (0.383)	3.133*** (0.439)	2.249*** (0.836)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.101	0.228	0.138
Adjusted R ²	0.043	0.108	0.055
Residual Std. Error	0.857 (df = 125)	0.777 (df = 45)	0.884 (df = 73)
F Statistic	1.756* (df = 8; 125)	1.899* (df = 7; 45)	1.667 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

Section 5: Conclusion

The ECB's public consultation as part of its strategy review shows that Europeans wish to see clearer, simplified and relatable communication by the central bank. Our research goes in this direction and sheds light on a topic which has been relatively absent from the literature: central bank communication with the general public. Our study provides empirical evidence that simplified and relatable central bank communication can enhance people's understanding of the messages conveyed by the ECB. Central banks' efforts to reach a wider public are not in vain.

Key findings of our randomised controlled trial on the ECB's communication include that simplified and relatable communication on the PEPP helps improve people's self-reported comprehension and enhances their direct understanding of the content. This is especially the case for a public less familiar with economics. People who do not have prior knowledge of economics are also more likely to report positive changes in their perceptions of the ECB, a key indicator of trust, when they read the simplified communication compared to the technical communication. Our results go in the same direction as the studies conducted by Haldane and McMahon (2018) and Bholat et al. (2018; 2019) who showed that the simplified and relatable communication of the BoE improves comprehension scores among participants. Our findings provide further evidence that simplified and relatable communication by central banks can be beneficial both to laypeople and to an audience who is already familiar with economic topics. A policy implication is that it could be beneficial for the ECB to create more targeted communication to the general public as it appears to be successful in building understanding of, and trust in, the central bank. Our study also indicates that the ECB could have much to gain by creating a simplified version of its monetary policy decisions, which the BoE did, and which appears to be successful in enhancing people's understanding of the Bank's key policy messages (Haldane and McMahon, 2018; Bholat et al., 2018; 2019).

Our findings fit with existing studies in the field of monetary policy and financial literacy. They confirm that coursework in economics enhances understanding of more technical content. Many central banks have been making efforts to inform and educate the public (Fluch, 2007): our findings further support the need for public economic education and justify the use of simplified and relatable communication as an effective tool for central banks to connect with a wider public.

We also find that individuals who know who the ECB President is and who are also aware of French inflation rates for 2020 score considerably better in comprehension questions. The positive effect is very strong concerning participants who correctly identified the current ECB President. This finding has a policy implication: it indicates that the ECB could further leverage Madame Lagarde's social media channels and speaking engagements to share relatable content relevant to the ECB's policy action in order to build awareness and understanding of the ECB's activities among the general public.

Our research also shows that women tend to feel less concerned by central bank topics (as shown by the significant difference in drop-out rates in the survey between women and men): this is in line with the gender gap found in the financial literacy literature (Hung et al., 2012). However, interestingly, when women do read the content, they are more inclined than men to report that they trust the content. An implication of this finding for the ECB could be that it would be worth investing in relatable communication on social media to better reach women and thus limit the obstacle to trust which we could call a “glass ceiling of comprehension”. Central banks’ presence on social media is all the more important as our research also reveals that when people are more inclined to access most of their news on digital platforms, they are less likely to understand the ECB’s communication. This could be due to a relatively small presence of central banks in online media and particularly on social media. Social media appears to be a way for the ECB to connect with European citizens, all the more so as research shows that non-experts are responsive to the ECB’s tweets (Ehrmann and Wabitsch, 2020). Undoubtedly, in the case of the ECB, a social media presence in the 19 eurozone countries, and in almost as many languages, will be one of the Bank’s future challenges to successfully build understanding and trust in the institution among European citizens.

Future research could extend our randomised controlled trial using a wider sample which is representative of the French population. It would also be fruitful to study the effect of changes in the ECB’s communication on the eurozone scale.

The effect of other communication techniques – such as visuals, graphics and videos – would also be useful to investigate to improve the general public’s comprehension of the ECB’s communication. As people usually receive messages from the central bank via the media, it would be worth studying if specific communication techniques enable greater coverage in traditional and social media. For this purpose, it could be of interest to survey journalists to understand which type of central bank communication they relate to most and would thus be more inclined to cover in news reports.

Finally, it would also be interesting to research whether the topic of a central bank’s communication is a determinant of understanding and see, for example, if more central bank communication on climate change and green finance would contribute to building awareness, understanding of, and trust in, the central bank among the general public.

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Annexes

ANNEX 1: SURVEY MATERIAL

1.1. Monetary Policy decisions (FR)

COMMUNIQUÉ DE PRESSE

Décisions de politique monétaire

10 décembre 2020

Compte tenu de la résurgence de la pandémie et de ses retombées économiques, le Conseil des gouverneurs a procédé, ce jour, à un recalibrage de ses instruments de politique monétaire.

Premièrement, le taux d'intérêt des opérations principales de refinancement ainsi que ceux de la facilité de prêt marginal et de la facilité de dépôt demeureront inchangés, à respectivement 0,00 pour cent, 0,25 pour cent et -0,50 pour cent. Le Conseil des gouverneurs prévoit que les taux d'intérêt directs de la BCE resteront à leurs niveaux actuels ou à des niveaux plus bas jusqu'à ce qu'il ait constaté que les perspectives d'inflation convergent durablement vers un niveau suffisamment proche de, mais inférieur à 2 pour cent sur son horizon de projection, et que cette convergence se reflète de manière cohérente dans la dynamique d'inflation sous-jacente.

Deuxièmement, le Conseil des gouverneurs a décidé d'augmenter l'enveloppe consacrée au programme d'achats d'urgence face à la pandémie (*pandemic emergency purchase programme*, PEPP) de 500 milliards d'euros, la portant à un total de 1 850 milliards d'euros. Le Conseil des gouverneurs a également décidé d'étendre l'horizon fixé pour les achats nets au titre du PEPP au moins jusqu'à fin mars 2022. Dans tous les cas, le Conseil des gouverneurs effectuera des achats nets jusqu'à ce qu'il juge que la crise du coronavirus est terminée.

Les mesures de politique monétaire adoptées aujourd'hui contribueront à préserver des conditions de financement favorables pendant la période de pandémie, favorisant ainsi le flux de crédits vers l'ensemble des secteurs de l'économie, soutenant l'activité économique et maintenant la stabilité des prix à moyen terme. Cela étant, l'incertitude reste forte, notamment en ce qui concerne la dynamique de la pandémie et le calendrier du déploiement des vaccins. Nous continuerons également de surveiller les évolutions du cours de change en lien avec leurs implications éventuelles pour les perspectives de stabilité des prix à moyen terme. Le Conseil des gouverneurs reste donc prêt à ajuster l'ensemble de ses instruments, de façon adéquate, pour assurer le rapprochement durable de l'inflation par rapport à son objectif, conformément à son engagement en faveur de la symétrie.

1.2. Coronavirus hub page (FR)

Notre réponse face à la pandémie de coronavirus

Nous avons, à la BCE, mis en place une série de mesures de politique monétaire et de supervision bancaire visant à atténuer l'incidence de la pandémie de coronavirus sur l'économie de la zone euro et à soutenir tous les citoyens européens.

Aider l'économie à absorber le choc de la crise actuelle

Le programme d'achats d'urgence face à la pandémie (*Pandemic Emergency Purchase Programme*, PEPP), à hauteur de 1 850 milliards d'euros, vise à réduire les coûts d'emprunt et à accroître les prêts dans la zone euro, ce qui devrait aider les citoyens, les entreprises et les gouvernements à accéder aux fonds dont ils peuvent avoir besoin pour surmonter la crise. Ce programme, à travers lequel nous acquérons différents types d'actifs, complète les programmes d'achats d'actifs que nous avons mis en place depuis 2014.

En achetant directement des obligations aux banques, par exemple, nous libérons plus de fonds qu'elles peuvent prêter aux ménages et aux entreprises. Nous pouvons aussi acquérir des obligations d'entreprises, ce qui leur fournit une nouvelle source de crédit. Ces deux types d'achats d'actifs concourent à stimuler les dépenses et l'investissement, afin de soutenir la croissance économique.

Maintenir les emprunts à un coût abordable

Ayant maintenu nos taux d'intérêt directeurs à des niveaux historiquement bas, les coûts d'emprunt restent faibles.

Nos taux directeurs influencent le coût des prêts. Lorsque les taux sont peu élevés, il est plus facile pour les ménages et les entreprises de contracter un emprunt, ce qui devrait favoriser les dépenses et l'investissement.

1.3. Monetary Policy decisions (EN)

PRESS RELEASE

Monetary policy decisions

10 December 2020

In view of the economic fallout from the resurgence of the pandemic, today the Governing Council recalibrated its monetary policy instruments as follows:

First, the interest rate on the main refinancing operations and the interest rates on the marginal lending facility and the deposit facility will remain unchanged at 0.00 per cent, 0.25 per cent and -0.50 per cent respectively. The Governing Council expects the key ECB interest rates to remain at their present or lower levels until it has seen the inflation outlook robustly converge to a level sufficiently close to, but below, 2 per cent within its projection horizon, and such convergence has been consistently reflected in underlying inflation dynamics.

Second, the Governing Council decided to increase the envelope of the pandemic emergency purchase programme (PEPP) by €500 billion to a total of €1,850 billion. It also extended the horizon for net purchases under the PEPP to at least the end of March 2022. In any case, the Governing Council will conduct net purchases until it judges that the coronavirus crisis phase is over.

The monetary policy measures taken today will contribute to preserving favourable financing conditions over the pandemic period, thereby supporting the flow of credit to all sectors of the economy, underpinning economic activity and safeguarding medium-term price stability. At the same time, uncertainty remains high, including with regard to the dynamics of the pandemic and the timing of vaccine roll-outs. We will also continue to monitor developments in the exchange rate with regard to their possible implications for the medium-term inflation outlook. The Governing Council therefore continues to stand ready to adjust all of its instruments, as appropriate, to ensure that inflation moves towards its aim in a sustained manner, in line with its commitment to symmetry.

1.4. Coronavirus hub page (EN)

Our response to the coronavirus pandemic

We at the ECB have put in place a set of monetary policy and banking supervision measures to mitigate the impact of the coronavirus pandemic on the euro area economy and to support all European citizens.

Helping the economy absorb the shock of the current crisis

The €1,850 billion pandemic emergency purchase programme (PEPP) aims to lower borrowing costs and increase lending in the euro area. This in turn should help citizens, firms and governments get access to funds they may need to weather the crisis. This programme complements the asset purchase programmes we have had in place since 2014.

We buy several different kinds of assets in this programme. For example, when we buy bonds directly from banks, we make more funds available that they can lend to households or businesses. We can also buy companies' bonds, giving them an additional source of credit. Both kinds of purchases help boost spending and investment, with the aim of supporting economic growth.

Keeping borrowing affordable

We have kept our key interest rates at historically low levels so borrowing costs remain low.

Our rates impact how much it costs to take out a loan. Low rates make it easier for people and companies to borrow funds, and should support spending and investment.

ANNEX 2: SURVEY QUESTIONS IN FRENCH

Questions posées aux participants Les bonnes réponses sont soulignées, le cas échéant	
Questions sur le profil des participants	
1.	Vous êtes : a. Une femme b. Un homme c. Autre d. Je préfère ne pas répondre
2.	Vous avez : a. 18-20 ans b. 21-23 ans c. 24 ans ou plus d. Je préfère ne pas répondre
3.	Sur une échelle de 1 à 5, dans quelle mesure avez-vous un intérêt pour l'actualité économique ? (1 : peu ; 5 : beaucoup) a. 1 b. 2 c. 3 d. 4 e. 5
4.	Où obtenez-vous la plupart de vos actualités ? a. Dans les journaux papier b. Dans les journaux en ligne c. A la télévision d. Sur les réseaux sociaux e. En écoutant des podcasts f. A la radio g. Sur des forums
5.	Qu'étudiez-vous ? a. L'économie b. Le droit c. Autre
Questions sur les connaissances dans la BCE	
6.	Quel est le rôle de la Banque centrale européenne ? a. Apporter un soutien financier aux banques européennes qui sont en difficultés financières b. <u>Maintenir la stabilité des prix en zone euro</u> c. Fixer la valeur de l'euro par rapport aux autres monnaies d. Je ne sais pas
7.	Qui est à la tête de la Banque centrale européenne ? a. Ursula von der Leyen b. Mario Draghi c. <u>Christine Lagarde</u> d. Je ne sais pas

Question sur l'inflation	
8.	<p>Quel était environ le taux d'inflation en France en 2020 ?</p> <p>a. 2%</p> <p>b. 7%</p> <p>c. <u>0.5%</u></p> <p>d. Je ne sais pas</p>
Question d'auto-évaluation de la compréhension	
9.	<p>Sur une échelle de 1 à 5, dans quelle mesure êtes-vous capable de comprendre le contenu et les messages de ce que vous venez de lire ? (1 : je ne comprends pas ; 5 : je comprends tout)</p> <p>a. 1</p> <p>b. 2</p> <p>c. 3</p> <p>d. 4</p> <p>e. 5</p>
Questions de compréhension directe	
10.	<p>D'après ce que vous avez lu, pourquoi la Banque centrale européenne maintient-elle des taux d'intérêt bas ?</p> <p>a. Pour aider les banques à accorder des crédits à tous les citoyens européens</p> <p>b. Pour augmenter l'inflation en zone euro</p> <p>c. <u>Pour continuer à soutenir les flux de crédit pour les personnes et les entreprises en zone euro</u></p> <p>d. Je ne sais pas</p>
11.	<p>D'après ce que vous avez lu, laquelle de ces affirmations est vraie en ce qui concerne le <i>Pandemic Emergency Purchase Programme</i> ?</p> <p>a. Il consiste à vendre des obligations des secteurs privé et public</p> <p>b. <u>Il consiste à acheter des obligations aux banques et aux entreprises</u></p> <p>c. Il consiste à contribuer à la protection des banques</p> <p>d. Je ne sais pas</p>
12.	<p>D'après ce que vous avez lu, quel est le but du <i>Pandemic Emergency Purchase Programme</i> ?</p> <p>a. Augmenter les taux d'intérêt en zone euro</p> <p>b. <u>Augmenter les investissements et la croissance en zone euro</u></p> <p>c. Baisser les prêts bancaires en zone euro</p> <p>d. Je ne sais pas</p>
Question de compréhension appliquée	
13.	<p>D'après ce que vous avez lu, quel est le but de la politique monétaire de la BCE ?</p> <p>a. Aider à financer les banques de la zone euro</p> <p>b. <u>Maintenir des niveaux d'inflation stables et soutenir la croissance économique en zone euro</u></p> <p>c. Eviter que la valeur de l'euro n'augmente trop rapidement par rapport aux autres monnaies</p> <p>d. Je ne sais pas</p>
Questions sur la confiance	
14.	<p>Comment l'extrait que vous avez lu a-t-il affecté votre perception de la Banque</p>

- centrale européenne (BCE) ?
- a. Cela a affecté ma perception de la BCE positivement
 - b. Cela a affecté ma perception de la BCE négativement
 - c. Cela n'a pas affecté la façon dont je perçois la BCE
15. Recommanderiez-vous le contenu que vous venez de lire à quelqu'un qui recherche des informations fiables sur l'économie ?
- a. Oui
 - b. Non
16. Sur une échelle de 1 à 5, dans quelle mesure faites-vous confiance à la Banque centrale européenne ? (1 : je ne fais pas confiance ; 5 : je fais entièrement confiance)
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
17. En quoi la lecture de l'extrait a-t-elle modifié votre point de vue ou vos attentes concernant les perspectives pour l'économie ?
- a. Cela a eu un effet positif sur mon point de vue et mes attentes
 - b. Cela a eu un effet négatif sur mon point de vue et mes attentes
 - c. Cela n'a pas affecté mon point de vue ni mes attentes

ANNEX 3: FURTHER INFORMATION ON REGRESSION MODELS

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 K_i + \beta_3 A_i + \varepsilon_i$$

In all regressions:

T_i is a dummy variable equal to 1 if participant i is assigned to the *Coronavirus hub page* (treatment group) and 0 otherwise.

K_i is a vector of knowledge variables:

Prior knowledge of the ECB's role: dummy variable equal to 1 if participant i knows the role of the ECB and 0 otherwise.

Prior knowledge of who the ECB President is: dummy variable equal to 1 if participant i knows who the ECB President is and 0 otherwise.

Prior knowledge of inflation: dummy variable equal to 1 if participant i knows the approximate inflation rate in France for 2020 and 0 otherwise.

A_i is a vector of socio-demographic control variables:

Gender: dummy variable equal to 1 if participant i is female and 0 otherwise.

Economics degree: dummy variable equal to 1 if participant i is enrolled in an economics course and 0 otherwise.

Economic engagement: continuous variable (1-5) indicating the degree to which participant i has an interest in economic news.

News source: continuous variable (1-6) indicating the degree to which participant i consumes their news from digital sources.

ε_i is the error term.

Regression for the two comprehension questions on the PEPP:

Y_i is treated as a continuous variable representing the number of correct answers of participant i in total in the two questions on the PEPP.

Regressions for each direct comprehension question and the applied comprehension question:

Y_i is treated as a dummy variable equal to 1 if participant i answers the question correctly and 0 otherwise.

Regression for score to comprehension questions overall:

Y_i is treated as a continuous variable representing the number of correct answers of participant i in total in the comprehension questions.

Regression for score to direct comprehension questions overall:

Y_i is treated as a continuous variable representing the number of correct answers of participant i in total in the direct comprehension questions.

ANNEX 4: REGRESSION RESULTS FOR COMPREHENSION QUESTIONS OVERALL

Regression results for comprehension questions overall

	Dependent variable		
	Overall score in comprehension questions (0-4)		
	<i>OLS</i>		
	(1)	(2)	(3)
Coronavirus hub page	0.067 (0.147)	0.053 (0.258)	0.090 (0.161)
Economics degree	0.098 (0.180)		
Knowledge of ECB President	1.174*** (0.321)	1.193*** (0.437)	0.606 (0.383)
Knowledge of inflation	0.457*** (0.163)	0.845*** (0.239)	0.116 (0.195)
Knowledge of ECB role	-0.003 (0.232)	0.065 (0.381)	-0.068 (0.259)
News source	0.052 (0.051)	0.156 (0.122)	0.015 (0.058)
Interest in economic news	0.055 (0.088)	-0.135 (0.133)	0.236** (0.113)
Female	0.083 (0.158)	0.252 (0.281)	-0.185 (0.172)
Constant	1.320*** (0.432)	1.109* (0.578)	1.787** (0.773)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.275	0.404	0.142
Adjusted R ²	0.228	0.311	0.060
Residual Std. Error	0.834 (df = 125)	0.962 (df = 45)	0.715 (df = 73)
F Statistic	5.912*** (df = 8; 125)	4.355*** (df = 7; 45)	1.727 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

ANNEX 5: REGRESSION RESULTS FOR DIRECT COMPREHENSION QUESTIONS OVERALL

Regression results for direct comprehension questions overall			
	Dependent variable		
	Overall score in direct comprehension questions (0-3)		
		<i>OLS</i>	
	(1)	(2)	(3)
Coronavirus hub page	0.189 (0.122)	0.132 (0.234)	0.213 (0.128)
Economics degree	0.245 (0.161)		
Knowledge of ECB President	1.054*** (0.298)	0.987*** (0.314)	0.726* (0.410)
Knowledge of inflation	0.311** (0.147)	0.798*** (0.251)	-0.109 (0.153)
Knowledge of ECB role	0.006 (0.200)	0.031 (0.294)	0.003 (0.194)
Digital news source	0.003 (0.043)	0.118 (0.104)	-0.031 (0.047)
Interest in economic news	-0.009 (0.087)	-0.176 (0.122)	0.158** (0.077)
Female	0.005 (0.138)	0.226 (0.244)	-0.293** (0.136)
Constant	1.032*** (0.599)	0.738 (0.580)	1.458** (0.591)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.302	0.413	0.214
Adjusted R ²	0.257	0.321	0.138
Residual Std. Error	0.693 (df = 125)	0.812 (df = 45)	0.545 (df = 73)
F Statistic	6.746*** (df = 8; 125)	4.519*** (df = 7; 45)	2.837** (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

ANNEX 6: REGRESSION RESULTS FOR EACH DIRECT COMPREHENSION QUESTION

	Regression results for each direct comprehension question					
	Dependent variable					
	Question 1 <i>logistic</i> (1)	Question 2 <i>logistic</i> (2)	Question 3 <i>logistic</i> (3)	Question 1 <i>logistic</i> (4)	Question 2 <i>logistic</i> (5)	Question 3 <i>logistic</i> (6)
Coronavirus hub page	-0.015 (0.084)	0.073 (0.057)	0.095* (0.046)	-0.398** (0.146)	0.333* (0.166)	0.163 (0.103)
Economics degree	-0.050 (0.096)	0.212* (0.083)	0.055 (0.048)			
Knowledge of ECB President	0.555*** (0.131)	0.153 (0.149)	0.184 (0.141)	0.550** (0.194)	0.562** (0.217)	0.107 (0.129)
Knowledge of inflation	-0.066 (0.097)	0.321*** (0.085)	0.019 (0.040)	0.163 (0.164)	0.572*** (0.137)	0.152 (0.091)
Knowledge of ECB role	-0.017 (0.119)	-0.048 (0.053)	0.094 (0.083)	-0.120 (0.171)	-0.227 (0.185)	0.249 (0.175)
Digital news source	-0.028 (0.035)	-0.003 (0.023)	0.015 (0.013)	0.139* (0.069)	-0.056 (0.076)	0.017 (0.023)
Interest in economic news	0.030 (0.048)	-0.019 (0.030)	-0.018 (0.018)	-0.026 (0.081)	-0.157 (0.100)	-0.045 (0.033)
Female	-0.056 (0.090)	0.024 (0.059)	-0.021 (0.035)	0.100 (0.165)	0.171 (0.192)	-0.011 (0.050)
Sample	All	All	All	Non-economists	Non-economists	Non-economists
Observations	134	134	134	53	53	53

Note:

*p<0.1; **p<0.05; ***p<0.01
Marginal effects from the logistic regressions are reported. Columns (1)-(3) show the results to each direct comprehension question for the full sample; columns (4)-(6) for non-economists.

ANNEX 7: REGRESSION RESULTS FOR THE APPLIED COMPREHENSION QUESTION

Regression results for the applied comprehension question

	Dependent variable		
	Score in applied comprehension question (0-1)		
	<i>logistic</i>		
	(1)	(2)	(3)
Coronavirus hub page	-0.118* (0.055)	-0.085 (0.080)	-0.101 (3.192)
Economics degree	-0.129* (0.059)		
Knowledge of ECB President	0.148 (0.151)	0.151 (0.145)	-0.138** (0.046)
Knowledge of inflation	0.144 (0.075)	0.048 (0.084)	0.199 (5.471)
Knowledge of ECB role	-0.009 (0.065)	0.026 (0.095)	-0.038 (1.257)
Digital news source	0.033 (0.019)	0.026 (0.029)	0.027 (0.847)
Interest in economic news	0.054 (0.029)	0.032 (0.038)	0.049 (1.564)
Female	0.074 (0.060)	0.023 (0.084)	0.084 (2.689)
Sample	All	Non-economists	Economists
Observations	134	53	81

Note:

*p<0.1; **p<0.05; ***p<0.01

Marginal effects from the logistic regressions are reported.
Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

ANNEX 8: REGRESSION RESULTS FOR TRUST QUESTIONS OVERALL

	Dependent variable		
	Overall score in trust questions (3-12)		
	(1)	(2)	(3)
Coronavirus hub page	-0.077 (0.235)	0.621* (0.345)	-0.504 (0.320)
Economics degree	-0.385 (0.266)		
Knowledge of ECB President	0.444 (0.349)	0.389 (0.317)	0.437 (0.668)
Knowledge of inflation	-0.097 (0.294)	0.282 (0.444)	-0.466 (0.413)
Knowledge of ECB role	0.179 (0.320)	0.685 (0.436)	-0.135 (0.435)
Digital news source	-0.015 (0.090)	-0.287* (0.147)	0.032 (0.130)
Interest in economic news	0.134 (0.137)	0.170 (0.154)	0.010 (0.212)
Female	0.551** (0.249)	0.262 (0.349)	0.596* (0.343)
Constant	7.939*** (0.665)	8.447*** (0.628)	8.560*** (1.429)
Sample	All	All	All
Observations	134	53	81
R ²	0.076	0.280	0.120
Adjusted R ²	0.017	0.168	0.036
Residual Std. Error	1.360 (df = 125)	1.199 (df = 45)	1.378 (df = 73)
F Statistic	1.287 (df = 8; 125)	2.502** (df = 7; 45)	1.423 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

ANNEX 9: REGRESSION RESULTS FOR OUTLOOK FOR THE ECONOMY QUESTION

Regression results for outlook for the economy question			
	Dependent variable		
	Outlook for the economy (1-3)		
	OLS		
	(1)	(2)	(3)
Coronavirus hub page	0.048 (0.076)	0.108 (0.130)	-0.003 (0.100)
Economics degree	-0.038 (0.099)		
Knowledge of ECB President	0.053 (0.144)	0.055 (0.141)	-0.155 (0.417)
Knowledge of inflation	0.072 (0.094)	0.181 (0.151)	-0.013 (0.120)
Knowledge of ECB role	-0.038 (0.121)	-0.022 (0.166)	-0.072 (0.176)
Digital news source	-0.009 (0.029)	-0.061 (0.053)	-0.002 (0.042)
Interest in economic news	-0.001 (0.043)	0.082 (0.071)	-0.085 (0.056)
Female	0.133* (0.079)	0.099 (0.129)	0.126 (0.099)
Constant	2.173*** (0.208)	2.078*** (0.284)	2.763*** (0.538)
Sample	All	Non-economists	Economists
Observations	134	53	81
R ²	0.030	0.139	0.073
Adjusted R ²	-0.032	0.005	-0.015
Residual Std. Error	0.444 (df = 125)	0.454 (df = 45)	0.430 (df = 73)
F Statistic	0.484 (df = 8; 125)	1.036 (df = 7; 45)	0.827 (df = 7; 73)

Note:

*p<0.1; **p<0.05; ***p<0.01

Robust standard errors are in parentheses.

Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.

ANNEX 10: REGRESSION RESULTS FOR RECOMMENDATION OF CONTENT QUESTION

Regression results for recommendation of content question

	Dependent variable		
	Recommendation of the content by participants (0-1)		
	<i>logistic</i>		
	(1)	(2)	(3)
Coronavirus hub page	0.025 (0.054)	0.087 (0.088)	1.0057e-05 (7.1354e-03)
Economics degree	-0.011 (0.063)		
Knowledge of ECB President	-0.007 (0.102)	-0.039 (0.085)	-1.4149e-02 (3.5682e+00)
Knowledge of inflation	-0.032 (0.063)	-0.011 (0.082)	-5.0748e-03 (1.3915e+00)
Knowledge of ECB role	-0.025 (0.073)	0.141 (0.145)	-1.0867e-01 (1.0861e+01)
Digital news source	0.026 (0.018)	0.012 (0.035)	1.6974e-03 (4.6504e-01)
Interest in economic news	0.029 (0.029)	-0.005 (0.039)	5.2247e-03 (1.4315e+00)
Female	0.177** (0.064)	0.137 (0.107)	1.3937e-02 (3.8075e+00)
Sample	All	Non-economists	Economists
Observations	134	53	81

Note:

*p<0.1; **p<0.05; ***p<0.01

Marginal effects from the logistic regressions are reported.
Column (1) shows the results for the full sample; (2) for non-economists; (3) for economists.