BRAIN-be 2.0

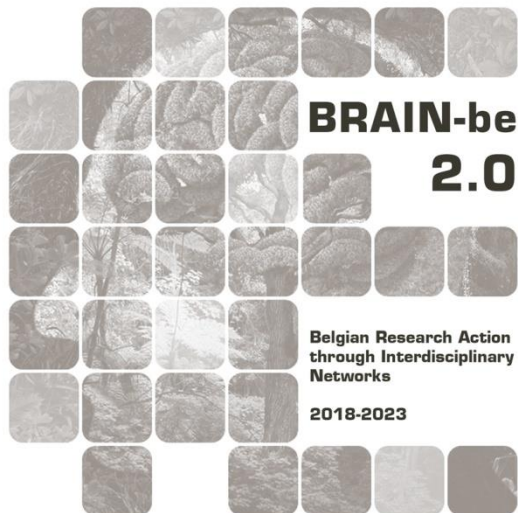**Belgian Research Action through Interdisciplinary Networks**

2018-2023

2O2CM

Overcoming Obstacles and Disincentives to Climate Change Mitigation: A cross-cutting approach by human and social sciences

LPI : Andrea Catellani (UCLouvain)

AUTRES PI - Louise-Amélie Cougnon (UCLouvain) Serge Guimond (Université Clermont Auvergne) Armelle Nugier (Université Clermont Auvergne) Michel Streith (Université Clermont Auvergne) Øyvind Gjerstad (University of Bergen) Kjersti Fløttum (University of Bergen)

belspo .be

NETWORK PROJECT

2O2CM

Overcoming Obstacles and Disincentives to Climate Change Mitigation: A cross-cutting approach by human and social sciences

Contract - B2/20E/P3/2O2CM

FINAL REPORT

PROMOTORS: Andrea Catellani (UCLouvain)
Louise-Amélie Cougnon (UCLouvain) Serge Guimond (Université Clermont Auvergne)
Armelle Nugier (Université Clermont Auvergne) Michel Streith (Université Clermont Auvergne) Øyvind Gjerstad (University of Bergen) Kjersti Fløttum (University of Bergen)

AUTHORS: Andrea Catellani (UCLouvain), Louise-Amélie Cougnon (UCLouvain), Serge Guimond (Université Clermont Auvergne), Armelle Nugier (Université Clermont Auvergne), Michel Streith (Université Clermont Auvergne), Øyvind Gjerstad (University of Bergen), Kjersti Fløttum (University of Bergen), Yuliya Samofalova (UCLouvain), Rose Harrington (Université Clermont Auvergne)

Neither the Belgian Science Policy Office nor any person acting on behalf of the Belgian Science Policy Office is responsible for the use which might be made of the following information. The authors are responsible for the content.

TABLE OF CONTENT

ABSTRACT

Context

Climate change (from now on CC) today is undoubtedly a challenge for humanity. The IPCC reports highlight the numerous dramatic consequences of CC; yet, the response of our societies has been slow, contradictory and elusive. CC and its consequences are particularly embedded in culture, making it difficult for individuals and societies to manage these phenomena cognitively. The humanities and social sciences are called on to make a crucial contribution to the understanding of how humans approach and make sense of CC and pro-climate behaviours, in order to reduce the value-action gap, using innovative forms of communication to identify entry-points for climate action.

Objectives

Our research aimed to enhance the identification of the barriers and deterrents hindering behavioural shifts and attitudes that would help to mitigate CC, by mobilising together various human and social sciences. Through the collaboration between disciplines (linguistics, semiotics, anthropology, and social-psychology), our goal was to advance current knowledge by integrating expertise on the interpretation of textual and visual signs that shape individual and cultural perceptions with the one on the social and psychological determinants influencing behaviours and attitudes. We conceptualise obstacles and deterrents as encompassing all factors, whether consciously acknowledged or subconscious, that impede or weaken pro-environmental behaviours. We compared Belgium, Norway, and France's trends in order to describe the cultural differences that underlie the variation of behaviours.

We articulated the work in 3 parts: (1) to identify the construction of awareness and understanding of CC in discourse practices, both in surveys and on digital social platforms; (2) to define the production of knowledge related to CC in a specific physical location; (3) to evaluate the impact of psychological variables on the production of CC meaning and on action in favour of CC.

Drawing upon existing literature across diverse research domains, our secondary objective was to contribute to identify effective communication strategies and to develop novel communication approaches and prototypes that will help mitigate obstacles to positive attitudes towards CC.

Conclusions

The 2O2CM study highlights a series of results that enhance the current state of the art and enable to conduct and develop new approaches to CC mitigation. First, the answers to open-ended questions collected in the 3 countries pinpointed a specific challenge related to the identification of "who should initiate action" that would lead to systemic changes: this vagueness can be interpreted as a sign of a difficulty for individuals to make sense out of a messy and complex reality. The narrative universes that we identified in the surveys in the 3 countries are often unclear concerning the roles of *heroes*: who is in charge, and how do we concretely operate for change? A minority of climate sceptics, or negationists, were identified, and they form a "discursive bubble" difficult to path through, given their refusal of any scientific consensus. Differences in perception of obstacles exist across countries: oil in Norway and lobbies and businesses in France are identified as obstacles to pro-climate shift, while

nuclear power has been cited by some Belgian respondents as a contribution to climate change mitigation.

On social media platforms, like Instagram, individuals often express difficulties and indicate obstacles concerning the organisation of pro-climate actions in their concrete life; most of the time, they indicate economic and social obstacles. Governments and businesses are often seen as *villains* in social media comments, where individuals often describe the system as difficult or impossible to change. Egoistic and hedonic values, linked to self-interest, are connected to actors that create obstacles to transition. Social media abound in recipes for change, but concrete information on means of action is still missing. Analysis on Twitter-X publications shows a distinction in the discursive universes of media and population on one side, and politicians on the other, perhaps creating a hiatus in communication between these segments. The study of tweets also shows that the expression of difficulty towards CC has increased through time, which might indicate that people experience more difficulties in taking action against CC, or that there is more awareness of these difficulties. The part of the 2O2CM project conducted in a natural park in France is in line with these results: this study reported a strong perception among the interviewees that the system is hard to change, and that there is resistance in organising pro-climate actions in their real lives. The study also revealed that individuals from the park do experience CC realities in their everyday life, in relation to their concrete situation, needs and problems, and produce a variety of knowledge and beliefs in relation to it.

The social-psychological part of the study offered new and interesting paths related to attitudes and behaviours towards CC. The mismatch model affirms that the opposition between norms and attitudes can motivate people to act in favour of social change, and this offers an interesting perspective: minorities can act in favour of change if their willingness to change norms is important. Conformism is not a universal destiny, and the perception of being a minority is not (necessarily) a brake to action: more slow and private influence of minorities can operate. This can encourage actions and also communication interventions aimed at showing that minorities can have an effect. Communication can contribute to social change by offering useful clues to people and activating their willingness to change norms. Active minorities can in return produce forms of "constructive deviance" from dominating norms.

The overall study of communication practices among the population and their reaction to news content, and political coverage on Reddit, Instagram and Twitter-X has also led us with the idea that there is a strong need for targeted communication about climate change issues. We recommend diversifying modes of communication whether it be among younger or older people: social media are inevitable among the youth, but not sufficient enough, and traditional media are not the only media among senior consumers. The study of media reception has shown that guilt is not the most appropriate source of motivation in communication campaigns: the presentation of inspiring role models is more effective, whether they be CC opinion leaders or lay people faced with everyday challenges.

Communication by scientists and other actors should use concrete experience and striking images, narratives, and involve the public in research, focusing on people, with the choice of the right and adapted images, and a focus on the right moments to change habits. We suggest that framing personal experiences and solutions should be internally consistent, culturally relevant, and feasible or concrete in the perceptions of the audiences. In the transport and energy sectors, controversies appeared in

our data concerning Instagram comments, regarding the use of electric vehicles, the transition to renewable energies, fossil fuel taxonomy, and nuclear energies. The communicators may focus on the controversies that appear in the comments and provide concrete information about existing and new technologies. To avoid further criticism of the posted content, this information should be supported by scientific sources. Since biospheric values are sometimes highlighted in the obstacles to the energy transition, these values should be better explained by communicators. Specifically, communication on social media can focus on the existing solutions used in the renewable energy industry to mitigate nature pollution and improve nature protection factors.

As replicable materia are concerned, we created several video formats that follow the recommendations detailed above. We developed in particular 3 main types of videos : an interactive video on object libraries, a narrative video on engagement for climate, and a participative, crowdsourced video on day-to-day practices and concrete impacts of CC. Initial analysis of video reception shows that narrative and interactive video communication can help in attracting attention to proclimate behaviours and solutions like object libraries and public engagement, in a context in which the public attention is a rare resource.

Keywords

Climate change, climate change mitigation, obstacles, disincentives, social sciences, linguistics, anthropology, psychology, semiotics, digital social networks, digital social media, communication.

RÉSUMÉ

Contexte

Le changement climatique (dorénavant CC) constitue aujourd'hui sans aucun doute un défi pour l'humanité. Les rapports du GIEC soulignent les nombreuses conséquences dramatiques du CC. Pourtant, la réponse de nos sociétés a été lente, contradictoire et limitée. Le CC et ses conséquences sont particulièrement ancrés dans la culture, ce qui rend difficile la gestion cognitive de ces phénomènes par les individus et les sociétés. Les sciences humaines et sociales sont appelées à apporter une contribution cruciale à la compréhension de la manière dont les humains abordent et donnent du sens aux comportements en faveur ou défaveur des CC, afin de réduire l'écart valeur-action, en utilisant des formes de communication innovantes pour identifier des nouveaux angles d'attaque dans l'action climatique.

Objectifs

Notre recherche vise à approfondir l'étude des barrières à la mobilisation pour le CC, en faisant se rejoindre diverses disciplines des sciences humaines et sociales. Grâce à la collaboration entre plusieurs disciplines (linguistique, sémiotique, anthropologie et psychologie sociale), notre objectif était de faire progresser les connaissances actuelles en intégrant l'expertise sur l'interprétation des signes textuels et visuels qui façonnent les perceptions individuelles et culturelles avec celle sur les déterminants sociaux et psychologiques qui influencent les comportements et les attitudes. Nous étudions tous les obstacles et les moyens de dissuasion, qu'ils soient consciemment reconnus ou inconscients, qui entravent ou affaiblissent les comportements pro-environnementaux. Nous avons comparé les tendances de la Belgique, de la Norvège et de la France afin de décrire les différences culturelles qui sous-tendent la variation des comportements. Nous avons articulé le travail en 3 parties: (1) identifier la construction de sens du CC dans les pratiques discursives, à la fois dans les enquêtes et dans les médias sociaux numériques ; (2) définir la production de connaissances liées au CC dans un lieu physique spécifique ; (3) évaluer l'impact des variables psychologiques sur la production de sens du CC et sur l'action en faveur du CC. En nous appuyant sur la littérature existante dans divers domaines de recherche, notre objectif secondaire est de contribuer à identifier des stratégies de communication efficaces et de développer de nouvelles approches de communication et des prototypes qui aideront à atténuer les obstacles aux attitudes positives envers le CC.

Conclusions

L'étude 2O2CM met en évidence une série de résultats qui améliorent l'état actuel des connaissances et permettent de mener et de développer de nouvelles approches d'atténuation des CC. Premièrement, les réponses aux questions ouvertes recueillies dans les 3 pays ont mis en évidence un défi spécifique lié à l'identification de ceux qui devraient initier une action qui conduirait à des changements systémiques : ce flou est interprété comme le signe d'une difficulté pour les individus à prendre des décisions et à faire sens dans une réalité désordonnée et complexe. Les univers narratifs que nous avons identifiés dans les enquêtes dans les 3 pays sont souvent flous quant aux rôles des *héros* : qui commande et comment opérer concrètement le changement ? Une minorité de climato-sceptiques, ou négationnistes, a été identifiée et forme une « bulle discursive » qu'il est difficile de

pénétrer, compte tenu du refus de tout consensus scientifique. La perception des obstacles varie d'un pays à l'autre : le pétrole en Norvège et les lobbies et entreprises en France sont considérés comme des obstacles au changement en faveur du climat, tandis que l'énergie nucléaire a été citée par certains Belges comme une contribution à l'atténuation du CC.

Sur les plateformes de réseaux sociaux, comme Instagram, les internautes expriment souvent des difficultés et signalent des obstacles concernant l'organisation d'actions pro-climat dans leur vie concrète ; la plupart du temps, ils indiquent des obstacles économiques et sociaux. Les gouvernements et les entreprises sont souvent considérés comme des *vilains* dans les commentaires sur les réseaux sociaux, où les individus décrivent souvent le système comme difficile, voire impossible, à changer. Les valeurs égoïstes et hédoniques, liées à l'intérêt personnel, sont attribuées aux acteurs qui créent des obstacles à la transition. Les réseaux sociaux regorgent de recettes pour le changement, mais il manque encore des informations concrètes sur les moyens d'agir.

L'analyse des publications Twitter-X montre une distinction entre les univers discursifs des médias et de la population d'un côté, et des hommes politiques de l'autre, créant peut-être un hiatus dans la communication entre ces segments. L'étude des tweets montre également que l'expression des difficultés à l'égard du CC est de plus en plus fréquente au fil du temps, ce qui pourrait indiquer que les gens éprouvent plus de difficultés à agir contre le CC, ou qu'il y a une plus grande conscience de ces difficultés. La partie du projet 2O2CM menée dans un parc naturel en France s'inscrit dans la lignée de ces résultats : cette étude fait état d'une forte perception parmi les personnes interrogées que le système est difficile à changer et qu'il existe des résistances à organiser des actions pro-climat dans la vie quotidienne. L'étude a également révélé que les individus du parc font l'expérience des réalités du CC dans leur vie quotidienne, en relation avec leur situation concrète, leurs besoins et leurs problèmes, et qu'ils produisent une variété de connaissances et de croyances à ce sujet.

La partie socio-psychologique de l'étude a offert des pistes nouvelles et intéressantes liées aux attitudes et comportements à l'égard du CC. Le modèle du mismatch affirme que l'opposition entre normes et attitudes peut motiver les gens à agir en faveur du changement social, ce qui offre une perspective intéressante : les minorités peuvent agir en faveur du changement si leur volonté de changer les normes est importante. Le conformisme n'est pas une destinée universelle, et la perception d'être une minorité ne constitue pas (nécessairement) un frein à l'action : une influence plus lente et plus locale des minorités peut s'opérer. Cela peut encourager des actions et des interventions de communication visant à montrer que les minorités peuvent avoir un impact. La communication peut contribuer au changement social en offrant des indices utiles aux gens et en activant leur volonté de changer les normes. Les minorités actives peuvent en retour produire des formes de « déviance constructive » par rapport aux normes dominantes.

L'étude globale des pratiques de communication au sein de la population et de sa réaction aux contenus d'actualité et à la couverture politique sur Reddit, Instagram et Twitter-X nous a également menés à l'idée qu'il existe un fort besoin d'une communication ciblée sur les enjeux du changement climatique. Nous recommandons de diversifier les modes de communication, que ce soit auprès des plus jeunes ou des plus âgés : les médias sociaux sont incontournables chez les jeunes, mais ne suffisent pas, et les médias traditionnels ne sont pas les seuls médias chez les consommateurs seniors. L'étude de la réception médiatique a montré que la culpabilité n'est pas la source de motivation la plus appropriée dans les campagnes de communication : la présentation de modèles inspirants est

plus efficace, qu'il s'agisse de leaders d'opinion du CC ou de personnes ordinaires confrontées à des défis quotidiens.

La communication des scientifiques et des autres acteurs doit s'appuyer sur des expériences concrètes, des images marquantes, des récits, et impliquer le public dans la recherche, en se concentrant sur les personnes, avec le choix des images justes et adaptées, et en se concentrant sur les bons moments pour changer les habitudes. Nous suggérons que la mise en place de solutions personnelles soit cohérente pour l'individu, pertinente sur le plan culturel et réalisable et concrète à ses yeux. Dans les secteurs des transports et de l'énergie, des controverses sont apparues dans nos données concernant les commentaires Instagram sur l'utilisation des véhicules électriques, la transition vers les énergies renouvelables, la taxonomie des énergies fossiles et les énergies nucléaires. Les communicateurs peuvent se concentrer sur les controverses qui apparaissent dans les commentaires et fournir des informations concrètes sur les technologies existantes et nouvelles. Pour éviter de nouvelles critiques sur le contenu publié, ces informations doivent être étayées par des sources scientifiques. Les valeurs biosphériques étant parfois mises en avant dans les obstacles à la transition énergétique, ces valeurs devraient être mieux expliquées par les communicants. Plus précisément, la communication sur les réseaux sociaux peut se concentrer sur les solutions existantes utilisées dans le secteur des énergies renouvelables pour atténuer la pollution de la nature et améliorer les facteurs de protection de la nature.

Nous avons aussi travaillé sur une boîte à outils réplicables en créant notamment plusieurs formats de vidéos qui suivent les recommandations détaillées ci-dessus. Nous avons notamment développé 3 grands types de vidéos : une vidéo interactive sur les bibliothèques d'objets, une vidéo narrative sur l'engagement pour le climat et une vidéo participative sur les pratiques quotidiennes et les impacts concrets du CC. Une première analyse de la réception des vidéos montre que la communication vidéo narrative et interactive peut contribuer à attirer l'attention sur des comportements et des solutions pro-climatiques comme les bibliothèques d'objets et l'engagement du public, dans un contexte où l'attention du public est une ressource rare.

Mots-clés

Changement climatique, atténuation du changement climatique, obstacles, désincitations, sciences sociales, linguistique, anthropologie, psychologie, sémiotique, réseaux sociaux numériques, médias sociaux numériques, communication.

ABSTRACT

Context

Klimaatverandering (voortaan CC genoemd) vormt vandaag ongetwijfeld een uitdaging voor de mensheid. De rapporten van het IPCC benadrukken de talrijke dramatische gevolgen van CC. Toch is de reactie van onze samenlevingen traag, tegenstrijdig en beperkt geweest. CC en de gevolgen ervan zijn diep ingeworteld in de cultuur, waardoor het voor individuen en samenlevingen moeilijk is om deze fenomenen cognitief te beheren. Er wordt een beroep gedaan op de geesteswetenschappen en sociale wetenschappen om een cruciale bijdrage te leveren aan het begrijpen van hoe mensen klimaatverandering en klimaatvriendelijk gedrag benaderen en begrijpen, om zo de kloof tussen waarden en actie te verkleinen door innovatieve communicatievormen te gebruiken om nieuwe invalshoeken voor klimaatactie te identificeren.

Doelstellingen

Ons onderzoek was gericht op het beter identificeren van de barrières en belemmeringen die gedragsveranderingen en houdingen in de weg staan, welke bijdragen aan de vermindering van CC. Dit deden we door verschillende disciplines binnen de geesteswetenschappen en sociale wetenschappen (taalkunde, semiotiek, antropologie en sociale psychologie) samen te brengen. Zo streefden we ernaar onze huidige kennis te vergroten door expertise over de interpretatie van tekstuele en visuele tekens, die individuele en culturele percepties vormgeven, te integreren met expertise over de sociale en psychologische factoren die gedrag en houdingen beïnvloeden. We beschouwen alle obstakels en afschrikmiddelen, bewust erkend of onbewust, die milieuvriendelijk gedrag belemmeren of verzwakken. We vergeleken de trends in België, Noorwegen en Frankrijk om de culturele verschillen te beschrijven die ten grondslag liggen aan gedragsvariaties.

We hebben het werk in drie delen opgedeeld: (1) het identificeren van de constructie van bewustzijn en begrip van CC in discourspraktijken, zowel in enquêtes als op digitale sociale platforms; (2) het definiëren van de productie van kennis gerelateerd aan CC op een specifieke fysieke locatie; (3) het evalueren van de impact van psychologische variabelen op de productie van betekenis van CC en op actie ten gunste van CC.

Ons secundaire doel was om op basis van bestaande literatuur uit verschillende onderzoeksdomeinen bij te dragen aan het identificeren van effectieve communicatiestrategieën en het ontwikkelen van nieuwe communicatiebenaderingen en -prototypen die kunnen helpen om obstakels voor een positieve houding ten opzichte van CC te verminderen.

Conclusies

De 2O2CM-studie belicht een reeks resultaten die de huidige stand van de kennis verbeteren en het mogelijk maken om nieuwe benaderingen voor de mitigatie van CC te ontwikkelen en uit te voeren. Ten eerste hebben de antwoorden op de open vragen, verzameld in de drie landen, een specifieke uitdaging aangewezen met betrekking tot de vraag "wie zou actie moeten ondernemen" die zou leiden tot systemische veranderingen: deze vaagheid kan worden geïnterpreteerd als een teken dat het voor

individuen moeilijk is om zin te geven aan een rommelige en complexe realiteit. De narratieve universa die we hebben geïdentificeerd in de enquêtes in de drie landen zijn vaak onduidelijk over de rol van helden: wie is verantwoordelijk en hoe kunnen we concreet werken aan verandering? Een minderheid van klimaatsceptici of negationisten werd geïdentificeerd en zij vormen een "discursieve bubbel" die moeilijk te doordringen is, gezien hun weigering van enige wetenschappelijke consensus. De perceptie van obstakels verschilt per land: olie in Noorwegen en lobby's en bedrijven in Frankrijk worden geïdentificeerd als obstakels voor een pro-klimaatverschuiving, terwijl kernenergie door sommige Belgische respondenten wordt genoemd als een bijdrage aan klimaatmitigatie.

Op socialemediaplatformen, zoals Instagram, uiten individuen vaak moeilijkheden en wijzen ze op obstakels met betrekking tot de organisatie van proactieve acties voor het klimaat in hun concrete leven; meestal betreffen deze economische en sociale obstakels. Overheden en bedrijven worden vaak gezien als *schurken* in de commentaren op sociale media, waar individuen vaak het systeem beschrijven als moeilijk of onmogelijk te veranderen. Egoïstische en hedonistische waarden, gekoppeld aan eigenbelang, zijn verbonden met actoren die obstakels voor transitie creëren. Sociale media staan vol met recepten voor verandering, maar concrete informatie over actiemiddelen ontbreekt nog steeds. Analyse van Twitter-X publicaties toont een onderscheid in de discursieve universa van media en bevolking aan de ene kant, en politici aan de andere kant, wat wellicht een hiaat in communicatie tussen deze segmenten creëert. De studie van tweets toont ook aan dat de uiting van moeite met CC in de loop der tijd is toegenomen, wat erop zou kunnen wijzen dat mensen meer moeite hebben om actie te ondernemen tegen CC, of dat men zich meer bewust is van deze problemen. Het deel van het 2O2CM project dat werd uitgevoerd in een natuurpark in Frankrijk, komt overeen met deze resultaten: deze studie rapporteerde een sterke perceptie onder de geïnterviewden dat het systeem moeilijk te veranderen is en dat er weerstand is tegen het organiseren van pro-klimaatacties in hun echte leven. Uit het onderzoek bleek ook dat individuen uit het park de realiteiten van CC ervaren in hun dagelijks leven, in relatie tot hun concrete situatie, behoeften en problemen, en dat ze een verscheidenheid aan kennis en overtuigingen hierover produceren.

Het sociaal-psychologische deel van het onderzoek bood nieuwe en interessante inzichten met betrekking tot verschillende houdingen en gedragingen ten opzichte van CC. Het mismatchmodel bevestigt dat de tegenstelling tussen normen en houdingen mensen kan motiveren om te handelen ten gunste van sociale verandering, en dit biedt een interessant perspectief: minderheden kunnen handelen ten gunste van verandering als hun bereidheid om normen te veranderen belangrijk is. Conformisme is geen universeel lot, en de perceptie een minderheid te zijn is niet (noodzakelijkerwijs) een rem op actie: een meer langzame en private invloed van minderheden kan werken. Dit kan acties aanmoedigen en ook communicatie-interventies die erop gericht zijn om te laten zien dat minderheden effect kunnen hebben. Communicatie kan bijdragen aan sociale verandering door mensen nuttige aanwijzingen te geven en hun bereidheid om normen te veranderen te activeren. Actieve minderheden kunnen op hun beurt vormen van "constructieve afwijking" van dominante normen produceren.

Het algehele onderzoek naar communicatiepraktijken onder de bevolking en hun reactie op nieuwscontent en politieke berichtgeving op Reddit, Instagram en Twitter-X heeft ons ook geleid tot het idee dat er een sterke behoefte is aan gerichte communicatie over klimaat-veranderingsproblemen. We raden aan om de communicatiemethoden te diversifiëren, of het nu gaat

om jongeren of ouderen: sociale media zijn onvermijdelijk bij de jeugd, maar niet voldoende, en traditionele media zijn niet de enige media bij oudere consumenten. Het onderzoek naar mediareceptie heeft aangetoond dat schuldgevoel niet de meest geschikte bron van motivatie is in communicatiecampagnes: de presentatie van inspirerende rolmodellen is effectiever, of het nu gaat om CC-opinitieleiders of gewone mensen die met alledaagse uitdagingen worden geconfronteerd.

Communicatie door wetenschappers en andere actoren zou gebruik moeten maken van concrete ervaringen en opvallende beelden, verhalen en zou het publiek bij het onderzoek moeten betrekken, waarbij de mens centraal staat, met de keuze van de juiste en aangepaste beelden en een focus op de juiste momenten om gewoonten te veranderen. We stellen voor dat het kaderen van persoonlijke ervaringen en oplossingen intern consistent moet zijn, cultureel relevant en haalbaar of concreet in de perceptie van het publiek. In de transport- en energiesector kwamen in onze gegevens controverses naar voren over Instagram-commentaren met betrekking tot het gebruik van elektrische voertuigen, de overgang naar hernieuwbare energieën, de taxonomie van fossiele brandstoffen en kernenergie. De communicatoren kunnen zich richten op de controverses die in de commentaren voorkomen en concrete informatie geven over bestaande en nieuwe technologieën. Om verdere kritiek op de geposte inhoud te vermijden, moet deze informatie ondersteund worden door wetenschappelijke bronnen. Aangezien biosferische waarden soms worden benadrukt in de obstakels voor de energietransitie, moeten deze waarden beter worden uitgelegd door communicatoren. Specifiek kan communicatie op sociale media zich richten op de bestaande oplossingen die gebruikt worden in de hernieuwbare energie-industrie om natuurvervuiling te verminderen en natuurbeschermingsfactoren te verbeteren.

Wat herbruikbare materialen betreft, hebben we verschillende videoformaten gecreëerd die de hierboven beschreven aanbevelingen volgen. We hebben met name drie hoofdtypen video's ontwikkeld: een interactieve video over objectbibliotheken, een verhalende video over engagement voor het klimaat en een participatieve, crowdsourced video over dagelijkse praktijken en concrete gevolgen van klimaatverandering. Een eerste analyse van de videoreceptie toont aan dat verhalende en interactieve videocommunicatie kan helpen om aandacht te trekken voor klimaatbevorderende gedragingen en oplossingen zoals objectbibliotheken en publieke betrokkenheid, in een context waarin publieke aandacht een schaars goed is.

Trefwoorden

Klimaatverandering, klimaatmitigatie, obstakels, belemmeringen, sociale wetenschappen, taalkunde, antropologie, psychologie, semiotiek, digitale sociale netwerken, digitale sociale media, communicatie

1. INTRODUCTION

This project was aimed at improving knowledge concerning human, cultural and psychological obstacles to CC mitigation in our societies, from the point of view of human and social sciences, to nourish a new international network, involving different disciplines and countries, and to propose a toolbox including videos, databases, and reports.

CC today is undoubtedly a main challenge for humanity, and a main aspect of the multiple ecological crisis we are already living through today. The different IPCC reports highlight the numerous dramatic consequences of CC; yet the response of our societies has been – and still is – slow, contradictory, and elusive. CC and its consequences are particularly embedded in culture, making it difficult for individuals and societies to manage these phenomena cognitively (Fløttum, 2018: 21): "[it] moved from being a predominantly physical phenomenon to being simultaneously a political, social, and cultural phenomenon – and thus, a communication challenge". This project is based on the postulate that humanities and social sciences are called on to make a crucial contribution to the understanding of how human beings approach and make sense of CC, in order to reduce the value-action gap, using innovative forms of communication to identify entry-points for climate action.

This research project had the transformative aim to improve the scientific understanding of why societies in Belgium, France and Norway are reacting insufficiently and too slowly to the risks of CC, and to understand how multimodal devices and recommendations can contribute to convert apathy into action. We investigated the essential role of language, narrative, images and discourses in shaping citizens' beliefs and actions, through the interdisciplinary and transdisciplinary collaboration between linguistics, semiotics, anthropology, and social psychological approaches. The project has developed a practical tool in the form of an open-source toolbox platform, providing reports, recommendations, videos and resources to citizens, public decision-takers and non-governmental organisations on CC perception, discourses, and communication. The next sessions will present objectives, methods, and results of the project.

Concerning the global structure of the project, WP1 (Lead Belgium) focused on the coordination of the project. WP2 (Lead Norway), through various surveys using open-ended questions, inquired how people produce, perceive and interpret narratives concerning climate change issues and how they construct their positions on CC by mediating different voices in society. WP3 and WP4 (Lead Belgium) was based on a linguistic and semiotic approach of online discourses about CC, aimed at identifying (1) how obstacles to CC mitigation emerge in posts and comments on Instagram concerning in particular food, travel and energy consumption, how they are linked to values, and how images and verbal text contribute to meaning making; (2) global tendencies concerning publications on sustainability and CC mitigation on Twitter (now X); and (3) strategies of disagreement and conflict in Reddit argumentations. In line with WP2, WP5 and WP6 (Lead France) aimed to examine how and why individuals can remain indifferent or sceptical to the risks of CC. First, social-psychological factors that determine citizen engagement in environmental behaviours were explored. Second, we analysed the effects of the CC risk on citizens' perceptions, behaviours, and attitudes, via a focus on a specific area in France.

The project has involved collaboration with non-academic partners in each country: we indicate the partners in section 5 here below.

2. STATE OF THE ART AND OBJECTIVES

Different human and social sciences, including linguistics (Fløttum, 2017 and 2018; Gjerstad and Fløttum 2022), information and communication sciences (Moser, 2016; Marshall, 2015; Schäfer and Xiaoyue, 2023), and social and environmental psychology (Gifford 2011, Stoknes, 2015, Steg, 2023), have addressed the topics of CC communication and sensemaking. The project was motivated by the "need for further transdisciplinary collaborations amongst environmental research fields" (Chen 2016: 108; Urbanska et al., 2019), for improving knowledge in our three countries, and for improving the translation of the results of these collaborations into more concrete actions and devices. Moreover, the focus of most research on CC communication has been on journalism and the USA (Evans Comfort and Eun Park, 2018); the scope of research had to be widened. The focus of this project on three European countries and different languages (French, Norwegian, and Dutch) was aimed at improving knowledge of different cultural and linguistic contexts, in which the CC conversation is less polarised than in the USA, and in which the role of the state is conceived of differently. These three countries also have different energy structures of production: Norway, a major exporter of oil and gas, produces most of its electricity from hydroelectric power plants; Belgium derives its electricity from nuclear, fossil fuels and renewable sources; and France relies most heavily on nuclear power for its electricity.

These differences play a significant role in influencing the evolution of public opinion, energy and environmental policies, and communication. Previous research focused mainly on news content, with less attention paid to the discourse on social media (Chadwick, 2017: 10). There was also the need to develop "visual research and the production of new visual research products", as a way of "expanding our knowledge of the social media life of CC, beyond dominant methods which focus on text" (Pearce et al., 2019: 1). In our work, one focus has been on digital social media, as they are a place of spontaneous expression (Cougnon et al., 2017) through which a large part of the population constructs its relationship to CC (Williams et al., 2015; Lewandowsky et al., 2019). The emphasis was also on digital social media less studied than Twitter (X) but highly significant, notably Instagram. Lastly, visual media, in particular visual images and videos in social media (Hansen, 2018), was included in the analysis.

From psychological and anthropological perspectives, the obstacles to CC mitigation behaviours were studied by using both qualitative and quantitative analyses. A large body of psychological (Khamzina, 2019) and anthropological research (Streith et al., 2009) had revealed various determinants of pro-environmental behaviours, all these factors influencing the behaviour independently. However, there was a gap in knowledge of interactive effects between personal and social factors when explaining individual behaviours in this domain (Khamzina, 2019 ; Harrington, et al. 2022; Deffuant et al. 2022). Our project focused on the examination of the interaction between personal attitudes and social norms as an independent behavioural determinant, especially in the context of social change, as is the case concerning the adoption of new approaches to the CC issue: Where do citizens locate themselves in terms of their individual and collective impacts on the social system? What does CC mean in different societal and generational contexts?

The **main objective** of our research was to improve knowledge of the disincentives and obstacles to behavioural change and attitudes related to CC mitigation from different perspectives of human and social sciences. The cooperation between specialists in linguistics, semiotics, anthropology, and psycho-social analysis was aimed at improving the state of the art, by combining expertise on texts

and images as indications of sense building by individuals and cultures, and expertise on social and psychological factors that influence behaviours and attitudes. We define obstacles and disincentives as all types of factors, both unknown and consciously known by people, that can prevent or weaken pro-climate behaviours. We worked on these obstacles not as obstacles *per se*, but from the point of view of *their presence in the subjective experience of people* as it can be analysed by studying in particular their discourses and communication. This is our basic epistemological option, which makes the difference in relation to the analysis of obstacles from a political, juridical, logistical, economic, etc. point of view.

Based on the existing literature in these different research fields, as well as a richer understanding of the disincentives and obstacles to CC mitigation, the **second objective** was to contribute to the improvement of effective communication methods to reduce disincentives and to better identify innovative ways to communicate on CC mitigation attitudes and behaviours of citizens. We decided to focus on a crucial communication support of our times, (short) video, and we produced 3 video projects, to experiment different techniques (interaction, narrative form and participation-crowdsourcing) concerning communication about climate-friendly practices and themes (see section 4).

3. METHODOLOGY

The presentation of our methodology is based on the specific questions that make the previously exposed objectives concrete.

The main question of this project derives from the first objective, and concerns the understanding of obstacles and disincentives to CC mitigation, from two main methodological point of view: discourses as vehicles of meaning and attitudes, and psychological variables that influence discourses and attitudes (which are overall evaluations of behaviour). How do people construct forms of knowledge, evoke values, identify obstacles, attribute roles (victims, heroes, villains) and develop attitudes, concerning CC mitigation, and what variables influence this meaning production and these attitudes?

We articulated the work in 3 parts: (1) to identify the construction of awareness and understanding of CC in discourse practices, both in surveys and on digital social platforms; (2) to define the production of knowledge related to CC in a specific physical location; (3) to evaluate the impact of psychological variables on the production of CC meaning and on action in favour of CC.

A. A first cluster of questions concerned **discourse** production, in surveys and on digital platforms.
A.1 How does the climate crisis reach people, and how do people produce meaning via discourses concerning what should be done and by whom (who are the main victims, heroes, and villains), and specifically which are the main obstacles, in the quest for CC mitigation? This cluster of questions implies the **linguistic analysis of open-ended questions**, submitted as part of surveys in the three countries. The Norwegian data was produced and collected through a national periodical survey in Norway, and we conducted corresponding surveys in France and Belgium. The analysis mobilised narratological and linguistic tools aimed at understanding linguistic "polyphony" (the evocation of

other voices in text and talk) and the attribution of narrative roles (like the ones of heroes, villains, and victims).

A.2 What are the forms of organised/strategic discourses on social media **platforms** like Instagram or Twitter-X, concerning mitigation of CC, how are they received, and therefore what spontaneous discourse is produced via comments? What narrative universe emerges from the analysis of posts and comments, and, in particular, which obstacles appear? This cluster of questions implies the analysis of carefully selected corpora of posts and comments collected on social media platforms, and the analysis of both visual and verbal (multimodal) aspects of these corpora. This part is articulated in the following three sections.

> **A.2.1 Instagram**: a corpus of posts, produced by opinion leaders and opinion leading organisations in Belgium, France, and Norway, and of comments by ordinary people has been constituted and analysed with different techniques (multimodal content quantitative and qualitative analysis, manual and automatic coding), to identify obstacles, values and roles. The analysis was focused on three particularly important sectors concerning carbon emissions and the Sustainable Development Goals, namely food, transport, and energy management. Multimodal analysis implied the coding of both verbal and visual contents, to have a complete picture of meaning construction.

> **A.2.2 Twitter (X)**: First, we used the Twitter collection methodology developed by Cougnon and De Viron (2021) to collect 3 corpora (France, Belgium and Norway), dating from 2007 to 2021, topically related to CC with a selection of keywords. We used the corpora from the 3 countries (1,9 million tweets) to analyse the expression of difficulty in the tweets: resistance, challenges and disincentives. We compared with different linguistic approaches data from Belgium and France on one side, and from France and Norway on the other side, to better understand the use and meaning in the different national languages of a crucial expression, i.e. "sustainable development". The research then focused on the Belgian corpus only (385,977 tweets) concerning CC, produced by laypeople, politicians and the media on Twitter. We conducted a 2-step-study: 1) the analysis of the distribution of the data across segments, time and particular accounts (most active, most mentioned); 2) the analysis of the presence and distribution of several important axes related to CC that have a crucial impact on individual life (food, transport, energetic efficiency).

> **A.2.3 Reddit**: we collected a corpus of 20k comments to posts related to CC in France, Belgium and Norway. These reactions enable a study of audience reception on a panel of precise issues. A quantitative analysis of 448 posts was conducted in order to better understand the cases of online impoliteness, more precisely on "mock politeness", which are cases of politeness as a strategy of attack, cases in which the message offers to the reader signs of courtesy within an overall negative and critical framework. This focus was motivated by the importance of controversy and discord on Reddit concerning climate issues, moreover on the observation of the power of mock politeness on unmotivation.

B. Another question concerned **knowledge production** on CC mitigation in a specific physical location. How do specific groups of people in a physical location produce meaning, specific knowledge, and discourse concerning CC mitigation? This question implied an anthropological inquiry in a specific

location impacted by CC, the Réserve Naturelle de Chastreix-Sancy in France, its visitors, and peasants living in the neighbourhoods. Our presence on the Scientific Council of the Chastreix-Sancy National Nature Reserve (Puy-de-Dôme, France) is linked to a desire on the part of the Reserve's members to include approaches from the social and human sciences. At a public conference attended by around a hundred people in the commune of Chastreix, a series of questions were put to the population: "Have you personally observed a change in climate, and if so, which one? What impact has it had on your daily life? How do you feel about CC? Our contribution consisted of an additional methodological enhancement. We suggested conducting open-ended surveys, without recourse to prior items and in a domestic setting, to better highlight the subjective dimension of perceptions. The research was thus mainly based on qualitative interviews.

C. The final questions concerned **psychological variables** influencing CC mitigation behaviours, and in particular the relation between norms and attitudes. What is the interaction between attitudes (i.e. overall evaluation of behaviour) and perceived norms (i.e. perceptions of others' attitudes, Guimond et al., 2013) as an important determinant of pro-environmental behaviour? When people feel a "mismatch" between dominant (non-sustainable) social norms and their own (sustainable) attitudes, what are the results? This question, focused on this "mismatch" and the mediating role of the willingness to change the norm, implied the use of multiple studies in France, and the analysis of data from point B. Using different quantitative methods (notably surveys and experimental studies) in six different studies, we questioned how this mismatch perception influenced French citizens' motivation to participate in social change and act pro-environmentally on an individual (i.e., eating less meat or using sustainable transportation) and collective level (i.e., voting for political parties that offer pro-environmental regulations, participating in marches for the climate, or even donating money to pro-environmental associations).

D. The **second objective**, concerning the production of **recommendations and new communication supports**, has been pursued by producing and evaluating videos, based on the results of the scientific inquiries, on existing literature and sources, and on the help of our non-academic partners (see the following sections for more details). We also compiled best practice recommendations to improve the communication strategies of politicians and the media.

Concerning **interdisciplinarity**, our project has been organised with the objective of creating interaction between scholars from different disciplines. This has been made concrete by organising periodical internal seminars to present the respective progresses and ideas. During one exchange for example the idea of "mismatch" between attitudes and norms (see section 4, C), constructed in the field of environmental psychology, was discussed and compared to an opposite theory from the field of communication and media studies, the theory of the "spiral of silence" by Noelle Neumann. This theoretical discussion was useful for the colleagues working on the mismatch theory, and improved their research (see Harrington et al. 2022). Also, the crucial notion for the analysis of Instagram (section 4 A.2), the one of environmental values, comes from the field of environmental psychology, and has been at the core of our analysis of posts and comments with a communication and multimodal discourse analysis approach. This allowed us to link the advances of environmental psychology to communication research in this study. These are concrete examples of the usefulness of discussions and exchanges between different disciplines.

4. SCIENTIFIC RESULTS AND RECOMMENDATIONS

A. *Discourse productions and obstacles to climate change mitigation*

A.1 Surveys and analysis of open-ended questions

Global warming is often surrounded by controversy, which is reflected in the views of the general public. A first analysis (Gjerstad, Ø., & Fløttum, K., 2021) was conducted on Norwegian answers to the following question : "In your opinion, what does it mean to live in a climate-friendly manner?". The survey provided 1,149 answers from respondents across Norway. The analysis combined a lexical and a text linguistic approach (Fløttum & Gjerstad, 2017), based on Adam's (2008) analysis of the narrative text sequence (initial situation–complication–(re)action–resolution–final situation), and inspired by the Narrative Policy Framework's (NPF) notions of plot and narrative characters (Jones et al., 2014). The analysis identified four main topics: consumption, transportation, politics, and energy, with consumption and transportation as the dominant topics. The cast of characters is dominated by the first-person singular, frequently portrayed as hero, and the first-person plural in a predominantly villainous role. Respondents tend toward positive self-representation with regard to their own role in fighting CC, while "we/us" as Norwegian or humanity never appear as actual heroes, but often as potential future heroes : in this sense, respondents consider future climate mitigation possible. It is worth noting also the vagueness of this "we/us", a general character that could be a sign of the difficulty in making sense of a complex issue and a messy reality. Another result was the frequent use of negation and argumentative connectives like concessive *but*, which allow the writer to manage different narratives and values and positions inside his/her own discourse: this reflects the contentious and multifaceted nature of the issue.

Our first comparative study took as its starting point opinion surveys of citizens in France and Norway, two European countries with different energy profiles (Oloko et al. forthcoming). Our surveys were based on the following two questions:

"Regarding the climate, France/Norway has the objective of considerably reducing greenhouse gas emissions.
a) In your opinion, what are the obstacles to achieving this goal?
b) In your opinion, what are the possibilities for achieving this objective?"

The open-ended nature of these questions enabled us to identify the solutions to the climate crisis proposed by citizens in each of the two countries, as well as the obstacles to overcoming it. Quantitative and qualitative/linguistic analyses of the responses revealed not only controversies that lie in the themes mentioned but also those that nest in the complexity of the linguistic units contained in the responses. A comparison of the solutions proposed, and the obstacles identified by the citizens of the two countries, reveal both similarities and differences. Citizens in both countries often think about the obstacles and solutions to the climate crisis by associating them with themes such as energy, oil, politics and politicians, lack of effort and will, standard of living, industries and businesses. However, while the Norwegians point to oil as an obstacle, the French emphasize the harmful role of lobbies and businesses.

Work is ongoing concerning the analysis of Belgian and Norwegian answers to a similar question, disseminated in surveys: "When it comes to CC, what do you think should be done?". Respondents in both countries identify the necessity to reduce consumption and travel, the opposition to windmills having a negative influence on the environment and also a general combat against pollution/destruction of the environment. An important difference concerns the emphasis on oil ('olje') in Norwegian answers and on nuclear power ('nucléaire') in the Belgian ones. Many of the Norwegian respondents tend to see oil and oil production as an important obstacle, while Belgian respondents seem to see nuclear power as a possibility to limit CC. These differences are clearly linked to the national situation concerning energy and political agenda. From a narrative point of view, the Belgian respondents tend to evoke actions without indicating a clear subject of action, as well as a generic and vague potential future hero, able also to activate the different actors of society (government, businesses). This was similar to the situation concerning Norwegian respondents to the same question. Another result was the qualitative identification of different narrative universes, with the last two partially mingling together: the one of climate negationists or sceptics, who negate the human-made nature of CC or its very existence (strong reference to a "natural" phenomenon); the one of social-political criticism, with the identification of villains in the form of government and businesses in particular, in opposition to the relative innocence and victimisation of the individual and layperson - a situation similar to Norwegian results too; finally, the universe of "recipes", lists of actions suggested to the individual or to larger entities like governments. Belgian respondents tend to point to capitalism, lobbies, the rich and the "big polluters", and sometimes some other countries, as villains.

This comparison allowed an interesting analysis of climate sceptic answers, manifesting different forms of scepticism like trend (i.e. the existence of CC), attribution (the causes of CC) and impact (the effects of CC) scepticism, which are represented in the two corpora (Belgian and Norwegian), even if attribution is the most dominant of the three. The prevalence of attribution scepticism might be significant in terms of its possible resilience in the face of empirical evidence, because doubts about the cause of CC wouldn't seem to be naturally altered or weakened by documented or personal experience of changing weather patterns, as the underlying causes could only be investigated through scientific methods which are already dismissed by many attribution sceptics.

A.2.1 Instagram

We collected 22882 posts by opinion leaders and opinion-leading organisations who communicate about CC and its mitigation on Instagram. For detailed analysis, we selected 10123 posts from January 2021 to March 2022, since this time frame covered the majority of the posts by the selected accounts.

To identify the posts about the food, energy, and transport sectors, we applied an automated content analysis based on a dictionary approach, which allowed us to select a corpus of 2092 posts for further detailed analysis. The results showed that the food sector was the most frequently discussed by the opinion leaders in the three countries and by opinion-leading organisations in France and Norway. The selected organisations in Belgium tended to post more about the energy topics. The majority of the posts were solution-oriented, possibly indicating that the enunciators adopt previously proposed communication strategies. In the three countries, individual actions were proposed as more concrete solutions in comparison to the group or collective actions. Opinion leaders emphasised the role of

individuals in tackling the climate crisis, while organisations highlighted the role of collective action. The role of the EU in CC mitigation was particularly mentioned in the Belgian data.

The identified obstacles in the posts were divided into two large categories: 1) individual obstacles (e.g., personal health and feelings, lack of money, actions of other people), 2) societal obstacles (e.g., inconsistent government's actions, and actions of companies and industries). Opinion leaders and organisations highlighted the problems linked to the communication about CC and to organising the solutions. Several emojis were observed as markers of obstacle discourse in the three countries: 🫤 , 🫤 , 😡 . In all countries, biospheric values appeared the most frequently in the posts. In general, the egoistic (care for personal status and possessions) and hedonic (care for personal feelings and comfort) values were linked to the obstacles.

Obstacles manifested through prominent visual symbols such as images depicting meat, emissions from fossil fuels, and pipelines associated with fossil fuels. Depicting business owners and politicians as obstacles to CC mitigation was a recurring theme across all four case studies. All accounts used a wide range of colours to discuss the climate crisis, where red and black colours were particularly associated with the obstacles. The obstacles appeared more frequently in the verbal part of the posts: posts' texts and the texts from the images. The linguistic markers of obstacles included in English: '*but*,' '*still*,' and '*just*'. In French, the markers of obstacle discourse were: '*certes … mais*,' '*c'est … mais*,' '*mais*,' '*problème*,' '*juste*,' '*même*,' '*même pas*,' '*quand même*,' and '*malheureusement*'. These words were used to emotionally highlight the meaning of the obstacle.

In the comments the obstacles were mainly on an individual level, underlining the problems with the organisation of the action in general, actions or opinions of other people, personal health and the importance of having choice to do the action. The comments analysis results demonstrated that eating less meat, using electric vehicles, and using renewable energy are controversial topics that are not clearly communicated by the media and organisations. However, the majority of the comments admitted the important role of opinion leaders in transmitting climate-related information. As in the posts, the obstacles in the comments were linked to the egoistic and hedonic values. However, we also observed a tendency to attribute biospheric values to the obstacles in the energy sector. Specifically, laypeople do not wish to use renewable energies because the production and installation of windmills and solar panels pollute the environment.

Our results from the analysis of comments on Instagram showed that audiences of the analysed posts mentioned mainly different personal barriers to adopting environmentally friendly practices. These personal barriers included problems with the organisation of the action in general, actions or opinions of other people, and personal health. These obstacles can be linked to the classification of internal barriers by Stankuniene, Streimikiene, and Kyriakopoulos (2020). The internal or individual barriers include social and psychological barriers, knowledge-based barriers, unconscious behaviour, and lack of motivation (Stankuniene et al., 2020).

The narrative roles in the posts and the comments in all countries represented mainly individual actors, group entities, specific industries for each sector, and nature and environment. Nature, environment, animals, and plants were represented as primary victims in the posts and the comments. The main heroes that should contribute to CC mitigation according to the posts and comments data were specific individuals such as 'me/myself', 'you'(the readers), and all people. The villain role was

particularly developed in analysed posts and comments, where the governments, companies, industries, specific politicians were seen as criticised for their irresponsible position toward the climate crisis. The politicians and industries were mainly seen as past and current villains–potential future heroes, meaning that their irresponsible position aggravates the climate crisis, yet they are the main actors that should contribute to CC mitigation.

A.2.2 Twitter (X)

We collected firstly a corpus of 385 977 Belgian French tweets concerning CC, mainly produced by laypeople, published between 2007 and 2021, and made quantitative observations on these data. The most mentioned accounts are mostly from general media channels or journals, but also from some information or political accounts that are focused on sustainability and CC. Politicians mostly mention political accounts from their own party for self-promotion, whereas the population only mentions media channels and influencers: this seems to indicate a separation in the communication spheres. Among the political parties, Ecolo is the party that tweets the most. The most typical keywords are "sécheresse", "biodiversité" and "recycler". Among the keywords, we also find hashtags in French and English, which reflect the international nature of the topic of CC.

We also annotated the corpus for terms related to food, transport and energetic efficiency, aspects through which people can have an individual impact on CC. 6.7% of the corpus includes an expression of one of the axes. Among the results, we can note transport and food are the most frequent, while energy efficiency only represents 9% of the axe-related tweets. Transport is mentioned equally by all segments, whereas energy efficiency is more mentioned by politicians, and food by the population.

Among the transport terms, the most mentioned is "voiture". In this case, media and population accounts show similar preferences in the use of the most frequent terms, whereas the politicians avoid mentioning polluting vehicles ("voiture", "avion") and tweet more about alternatives ("vélo", "transports en commun"). This indicates a clear distinction in the discursive universes of media and population on one side, and politicians on the other.

Concerning energy, "renovation" has become the most frequently mentioned. It is also the most frequent term for the politicians, while the population tweets more about "chauffage", showing that it is a more prominent concern for this segment.

Finally, another objective was to extract the expressions of difficulty so as to understand what are the obstacles for taking action against CC. 31 types of expressions and 5 emojis were annotated (nouns, adjectifs, constructions), as well as their combinations. 13 559 tweets included a difficulty expression (about 4% of the total corpus). Politicians express difficulty proportionally more than the other segments, however, they prefer the term "défi" which implies that the difficulty can be overcome, and they avoid the adjective "impossible".

In general, tweets that express difficulties have increased through time, which might indicate that people experience more difficulties in taking action against CC, or that there is more awareness of the difficulties. As for the axes, Twitter users express more difficulties while speaking about transport and energy efficiency than about food. Concerning emojis, difficulty expressions are not often combined

with more than one emoji at once, which indicates that their accumulation might be redundant. The emoji that is most frequently combined with an expression of difficulty is the confused face 🙄 .

Another research (still ongoing) aims at analysing potential differences in the meaning of 'sustainable development' in the three countries: Belgium, France and Norway. This was done through the analysis of 3 self-collected corpora of tweets from the 3 countries (France, Belgium and Norway), dating from 2007 to 2021, topically related to CC with a selection of keywords. 3 types of analysis were performed using the Sketch Engine tool: (1) a keyword analysis of the relevance of the term in each corpus, by comparing the "sustainable" corpora with the most general web corpora; (2) a collocation analysis, so as to analyze the differences in meaning within CC discourse on Twitter-X, based on the linguistic context; (3) a polyphonic analysis (Nølke et al. 2004, Fløttum & Gjerstad, 2013), to observe the implicit points of view about sustainable development introduced in discourse. Results already confirmed that "sustainability" is a more prominent keyword in the Norwegian corpus, which also shows more expressions of negation and concession ("even if…", "but…"): this may be a sign of a more controversial and difficult issue, as already observed in section A.1. The comparison also allowed us to see the influence of local topics, like the links of sustainable development with peace, democracy and growth in Norway, with environment and ecology in France, and with environment and economy in Belgium.

A.2.3 Reddit

We collected a corpus of 20k comments to posts related to CC in France, Belgium and Norway. Posts were written between 06-09-19 and 20-08-23. Reddit is a social media, that allows scientific projects to work on reactions to publications at different levels, described in Gutierrez Figueroa et al. (2020). Mock politeness is a common strategy among speakers on social media: 21% of comments contain one or more mock politeness acts. In climate related conversations, this strategy is often used by non-skeptical speakers against skeptical web users, which makes it very interesting in the framework of a peer-based motivational study.

As a reminder, "mock politeness" acts are cases of politeness as a strategy of attack, cases in which the message offers to the reader signs of courtesy within an overall negative and critical framework. In this context, the opposition of politeness and threats increases the subjectivity of interpretation. This is why the annotation process was specifically difficult and a longer time was devoted in our methodology to agreeing on an annotation scheme, which was evaluated positively (k=0,67) using the kappa measure (McHugh, 2012).

The annotation scheme resulted in a 4 class-typology grid of mock politeness that is available for replicability, and which is constituted of: *visualisation, indirection, appreciation*, and *concession*. *Visual mock politeness* (7%) is a comment on a post that aims at threatening another comment, and softens the attack by using a visual component, as a smiley, the multiplication of letters or symbols (ex. 1). Reddit has also developed its own smiley (/s) allowing speakers to explicitly indicate that their remarks should be read in a sarcastic tone. In doing so, the /s can signal a mock politeness situation (ex. 2). *Indirect mock politeness* (44%) is a comment on a post that aims at threatening another comment, and softens the attack by using an interrogative (ex. 3), impersonal or conditional proposition. In this category, the speaker uses strategies specific to negative politeness (concept developed by Brown and

Levinson which refers to all politeness strategies allowing to reduce the force of the attack) by using indirection strategies. *False appreciations* (15%) are comments on a post that aim at threatening another comment, and soften the attack by using words or expressions that value the interlocutor (ex. 4) or thank him or her, or by expressing a wish. Here, the facework is based on positive politeness strategies (also a concept developed by Brown and Levinson which refers to all politeness strategies allowing the interlocutor's face to increase). Finally, *Concessive mock politeness* (34%) is a case of complete irony, where the speaker pretends to agree in a first part of the proposition and then mocks the interlocutor in a second part, formally using a conjunction as *mais* (ex. 5), or demonstrating false modesty.

ex. 1 "Cool je vais pouvoir aller surfer plus tôt dans l'année, c'est une bonne nouvelle ! C'est une bonne nouvelle hein **??**"

ex. 2 "mais arrêtez d'être méchant avec nos gentils boeufs! il leur faut du mais! ils nous donnent des belles entrecotes! on est gentil avec les bêtes! **/s**"

ex**.** 3 **"**Savoir ça dans sa tête, où le dire sur internet, ça fait pousser **combien** d'arbres **?"**

ex. 4 "**C'est magnifique** : accusation ad hominen, immaturité de l'action, rhétorique de l'effet pervers, rhétorique de l'inutilité. Il manque la thèse de la mise en péril pour cocher le bingo de la rhétorique réactionnaire pointée par A. Hirschman mais comme **t'es généreux** tu l'as remplacé par une simili-empathie auprès des agents de nettoyage. **Je suis fan**."

ex. 5 "Oui le risque qu'un barrage craque "est potentiellement plus élevé qu'une explosion de centrale" vu qu'une centrale ça ne peut pas exploser. **Mais** je ne vois pas toujours pas en quoi c'est pertinent de comparer les deux."

One of the hypotheses that underlay the study was that impoliteness about climate issues in social media would be less appreciated and interpreted as face threatening acts (FTA). The evaluation of this hypothesis was made possible thanks to the upvote/downvote system of Reddit that gives a score to each comment. Our results show that mock politeness, while conveying irony, succeeds in gaining popular acceptance, in particular for type 1, the visual mock politeness. Irony acts as a softener that gains popular vote by conveying a false idea of humour. The implicit FTA is not downvoted because the score is given by the community and not by the interlocutor. In conclusion, our study shows that the weight of community approval in mock politeness is heavy in the Reddit conversations and tends to knock the interlocutor down.

The second result of this study is directly related to the first one: at the individual level, mock politeness does not encounter positive reception. On the contrary, the interlocutor seems either angry or frustrated by the attitude of the other speakers. In most of the comments that included mock politeness, the debate even suffered from a shift from the content level to the formal level (grammar, spelling, specific expressions or words that were used). In other cases, irony keeps going around in circles (example 6). By using mock politeness in their messages, non-sceptical speakers do contribute to polarisation and demotivation of the sceptical community on social networking sites.
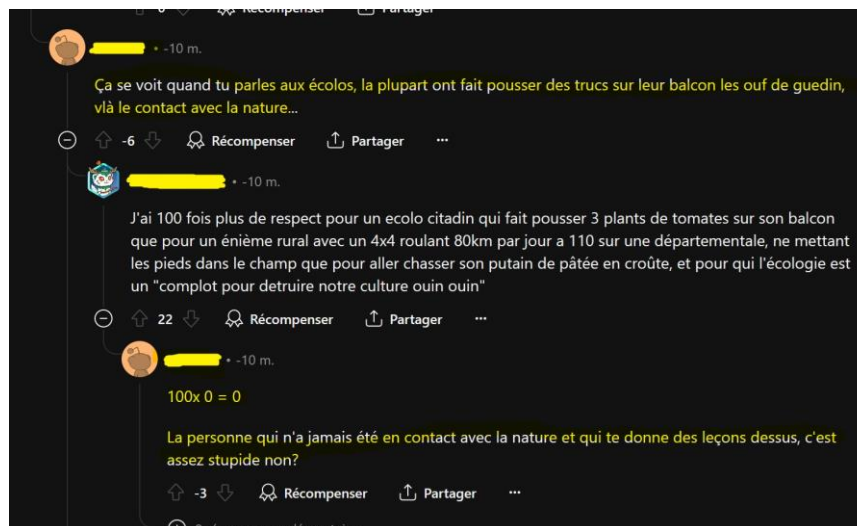
ex. 6 Extract of comments to the post *On arrivera à rien en écologie tant que le niveau de connaissances environnementales de la population sera si bas* r/France

B. knowledge production on climate change mitigation in a specific physical location

Many of the decisions and scenarios concerning the management of CC are drawn up at international conferences and summits on a planetary scale. Recently, however, climatologists have suggested "projections on smaller scales" (Ribes, 2022). Based on an anthropological approach, our research (Streith, in prep.) proposes a reading of CC from a household and local perspective. This choice is guided by the desire to uncover citizens' knowledge of CC in everyday situations. The field of investigation covers the territory of the Chastreix-Sancy National Nature Reserve (Puy-de-Dôme, France).

Interviews with people from very different backgrounds revealed a wide range of knowledge, including environmental knowledge and agricultural adaptations, but also educational knowledge, political issues and unexpected digressions. These results are currently being analysed using human and social sciences (anthropology, sociology, philosophy), which enabled us to identify specific features held by citizens on the scale of rural territories. Even if people have a global knowledge of CC, what emerged mostly from the anthropological analysis were "proxies" (Petit et al. 2019), which are local, concrete and immediate signs of CC, and concrete forms of knowledge linked to the experience and concrete situation and problems of each person. The conceptions of CC as expressed by the interviewees highlight themes like water, agriculture, snow, trees, skiing, sustainable development, conferences and training courses. Some themes are linked to tension, including politics, mobility, and urban/rural relations. Indeed, interviewees reported a strong perception that the system is very difficult to change, and that a lot of difficulties exist in organising pro-climate actions in their real lives.

C. Psychological variables influencing attitudes and obstacles to climate change mitigation behaviours: the mismatch model

What happens when people perceive a difference or mismatch between their own attitudes and social norms? We conducted a study (Harrington et al. 2022, see also Harrington, 2024) to test the mismatch model which aims at explaining what motivates individuals to participate in normative change. This model stipulates that perceiving a self—other difference in pro-environmental attitudes is the starting

point and can motivate people to have high pro-environmental intentions. This mismatch effect is explained by participants' willingness to participate in normative and social change: people that perceive a gap between their personal attitude and the social norm should be more willing to participate in normative change. This should then motivate them to have high pro-environmental intentions on an individual and group level.

We built our first study on a specific environmental challenge: meat consumption. The study, made by using a questionnaire, involved 486 people in France, both vegan and vegetarian, and still eating meat. The results confirm the hypothesised model on an individual and group level and explain how people can be motivated to participate in normative change. The study provides a better understanding of how vegetarians maintain their pro-environmental intentions, despite the social pressure to do otherwise. Indeed, our findings suggest that they perceive a gap between their attitude and the social norms, and this motivates them to change the current social norm. This willingness to participate in normative change is what then leads to vegetarians maintaining their individual intentions, and even having higher levels of group-level pro-environmental intentions. The study was focused on intentions and not directly on behaviours, so future research should focus on concrete behaviours concerning the mismatch hypothesis.

Five other unpublished studies (Harrington, 2024), that are presented in Rose Harrington's PhD thesis, were carried out during this research project to replicate these first findings. Two of these studies (total sample size of 772) used a fictive society paradigm to see whether exposing participants to different normative messages on pro-environmental action, after having measured their own attitudes towards these same behaviours, would significantly affect their pro-environmental behaviour in this fictive society (i.e., ordering vegetarian meals or giving money to a pro-environmental association). The results of these two studies suggest, unlike the first study, that the mismatch perception might not always be a significant and direct predictor of pro-environmental intentions. Even if the results are not all statistically significant, its indirect and positive effect via the willingness to change social norms has greater potential to motivate pro-environmental intentions and behaviour.

We, lastly, conducted three studies (total sample size of 925) to see whether including other psychological variables in the mismatch model could explain why we did not obtain the same results as the first published study. We, more specifically, wanted to see if perceived behavioural control (i.e., how feasible a behaviour seems) and perceiving social norms as dynamic (i.e., thinking that they can change and evolve with time) would provide us with more consistent results. In analysing the results of these studies, we found that while perceived behavioural control could play a role in the mismatch model, this is not the case for dynamic social norms. Perceived behavioural control influences the relation between the willingness to change social norms and individual intentions: the willingness to change norms has a bigger effect on intentions when people perceive a low level of control, compared to individuals who perceive a high level of control on behaviour. In other words, even when people feel difficulties to adopt pro-environmental behaviours (i.e., low level of control, perception of obstacles), variables of purely social nature (like the willingness to change social norms) can still motivate pro-environmental action. Perceiving social norms as dynamic, however, did not change the found results and the studies examining this factor do not support the mismatch model.

To summarise, these additional results suggest, unlike the first study, that the mismatch perception might not always be a significant and direct predictor of pro-environmental intentions. Its indirect and positive effect via the willingness to change social norms has greater potential to motivate pro-environmental intentions and behaviour. Its' effect is, however, inconsistent and future studies are needed to explore this indirect effect so that we can have a better understanding of how it can be used efficiently in awareness-raising campaigns aimed at social change. On this basis, future behavioural change interventions could consider these results to better support active minorities and to also lead others into participating in normative change.

Final remarks on scientific results

The analysis of the results of the surveys and the analysis of comments on digital social networks has shown that subjects linked to action for CC are still controversial, sometimes unclear and difficult to understand. The narrative universes that we identified in the surveys in the different countries are often unclear concerning the roles of heroes, who is in charge, and how concretely operate for change. A minority of climate sceptics, or more exactly climate negationists, exists, and constitutes a sort of "discursive bubble" difficult to deal with, given their refusal of scientific consensus.

People often express difficulties and indicate obstacles concerning the organisation of pro-climate actions in their concrete life, and indicate economic and social obstacles. Governments and businesses are often seen as villains, and people perceive in many cases the system as difficult or impossible to change. A structural change is often considered as very difficult to achieve. Recipes for change are expressed, but information is still an issue.

D. Recommendations and prototypical videos

The **second main objective** of the 2O2CM project was to draw upon all scientific results to build up a practical toolbox containing information, recommendations, and replicable materia. **Information given about** the project's results in numerous scientific papers, manuals and reports, are described and listed in parts 5 and 6 and made available online on the project's website. We only detail here the recommendations (D.1) and video outcomes (D.2).

D.1 In terms of **recommendations**, we present different sets of recommendations provided by the various work packages of the project.

First, we summarise the recommendations for communication practitioners. The *Instagram-based study* (see section A.2.1) has led to several important conclusions that can be implemented. The most engaging content about reducing meat consumption in our data included personal experiences and recommendations. Following the recommendations of de Boer and Aiking (2017), we suggest that framing personal experiences and solutions should be internally consistent, culturally relevant, and feasible or concrete in the perceptions of the audiences. In the transport and energy sectors, controversies appeared regarding the use of electric vehicles, the transition to renewable energies, fossil fuel taxonomy, and nuclear energies. The communicators may focus on the controversies that appear in the comments and provide concrete information about existing and new technologies. To avoid further criticism of the posted content, this information should be supported by scientific sources. Since biospheric values are highlighted in the obstacles to the energy transition, these values should be better explained by communicators. Specifically, communication on social media can focus

on the existing solutions used in the renewable energy industry to mitigate nature pollution and improve nature protection factors.

Audiences' engagement depended on the type of content posted on Instagram: still images achieved more likes, while videos gained more comments. Therefore, to increase the users' involvement in the comments and to understand their opinions, we recommend to post video content instead of images. This video content should be clear, objective, creative, dynamic, and informative (Ferreira et al., 2023). We also recommend avoiding red, black, and too dark colours in visual communication, since they may be associated with obstacles and fear-induced (O'Neill and Smith, 2014). Opinion Way and ADEME (2023) have recently shown that people know less about the environmental NGOs. Nevertheless, smaller environmental organisations play an important role in the sustainability transition and their recognition and partnerships with them can significantly contribute to raising citizens' awareness and to bridging global and local actions. Since opinion leaders were seen as reference figures by many lay people in this study, we suggest that communication practitioners should identify and collaborate with opinion leaders in their field on global and local levels.

The overall study of communication practices among the population and their reaction to news content, and political coverage on Reddit, Instagram and Twitter has led us with the idea that there is a strong need for targeted communication about CC issues. Of course, younger and older people do not understand or receive information about CC in the same way, nor do Norwegian and French people. The choice of words, images, and modes of communication differ considerably between audiences. For example, a study of preferences among the youth suggested that they prefer positive and empowering communication, and that CC communication should be transversal in the media to avoid isolating the subject of CC. We also recommend to diversify modes of communication whether it be among younger or older people: social media are inevitable among the youth, but not sufficient enough, as traditional media is not the only media among senior media consumers. Finally, the study of media reception has shown that guilt is not the most appropriate source of motivation in communication campaigns: the presentation of inspiring role models is more effective, whether they be CC opinion leaders or lay people faced with everyday challenges. Communication by scientists and other actors should use concrete experience and striking images, narratives, and involve the public in research, focusing on people, with the choice of the right and adapted images, and a focus on the right moments to change habits.

From the social-psychological perspective, the mismatch model also introduces a useful recommendation. It affirms that the opposition between norms and attitudes can motivate people to act in favour of social change, and this offers an interesting perspective: minorities can act in favour of change if their willingness to change norms is important. Conformism is not a universal destiny, and the perception of being a minority is not (necessarily) a brake to action: more slow and private influence of minorities can operate (Harrington et al. 2022, Lalot et al., 2018). This can encourage actions and also communication interventions aimed at showing that minority action can have an effect. As Harrington et al. (2022) affirm (p. 8), "using informational strategies (see Steg & Vlek, 2009, for a review on informational strategies) that broadcast normative messages could remind individuals that the social norm is less favourable than they would like, and consequently activate their willingness to change social norms. This would push them to participate more in environmental action (i.e., eat less meat, or participate in collective action). This intervention would, however, only heighten environmental behaviours for participants that perceive a mismatch with their attitudes higher than

the norm". This suggestion, even if research is needed on the mismatch model, shows that communication can contribute to social change by offering useful clues to people and activating their willingness to change norms. Active minorities can in return produce forms of "constructive deviance" from dominating norms (see scientific literature on this notion in Harrington et al. 2022: 7).

D.2 As **replicable materia** are concerned, we created several video formats that follow the recommendations detailed above. We decided to contribute with our project to the field of communication for social change mainly by developing video projects, which offer an exemplification of different techniques and communicative solutions applied to different themes linked to CC. We imagined videos as replicable prototypes, with a focus on the concrete life and inner, subjective experience of obstacles and brakes of people. Communication is just one lever for change among many others, both political, legal and economic (see the difference and complementarity between informational strategies and structural strategies in behavioural change, Steg & Vlek 2009). But communication, in the sense of crafting and spreading messages and developing forms of one-way or multiple-way communication (dialogue, conversation), has its place in social change because of the nature of human beings, who are active in seeking and sharing meaning about their life and practices through signs and discourse, and because of the necessity of a social mandate for structural change: people-centred policies are crucial to social transformation (Verfuerth et al., 2023). Video content is essential since videos can positively influence awareness and concern about CC issues (Ballantyne et al., 2016). The videos explored different communicational solutions applied to specific pro-climate themes. The video support was chosen because of its importance in nowadays culture and society.

We developed 3 main types of videos: an interactive video on object libraries, a narrative video on engagement for climate, and a participative, crowdsourced video on day-to-day practices and concrete impacts of CC. We detail these 3 types hereafter. The project's website's toolbox also presents the videos produced by a related project conducted at UCLouvain MiiL laboratory on seniors' attitudes towards CC in Belgium (see also Harrington et al. 2023). The videos show dialogues between people of different generations on CC and transition, as an application of the recommendation of supporting exchange and communication between different generations.

All videos developed in the project are and will be at the disposal of our partners and of organisations and social actors, both private and public, and are also useful as research objects to be tested and evaluated in order to understand how publics receive and interpret them.

D.3.1 **Interactive video: object libraries**

The first project was developed in collaboration with the Usitoo cooperative in Brussels, which was an object library aimed at improving the circular economy. The director, Xavier Marichal, helped us in identifying specific needs, in particular the following:

- Emphasise the practical aspect of object libraries
- Underline the benefits of borrowing objects
- Prefer positive, non-moralistic communication
- Marking minds with an original, fun video
- Show a female character
- Each stage of the scenario must be simple, concise and fast

The video was the occasion to develop a "win-win" strategy concerning the depiction of values, combining in the same text biospheric, altruistic, hedonistic and egoistic values (Bouman et al. 2021), in order to address different publics than the already-engaged and convinced ones.

The main formal feature of the video is the use of interactivity: the viewer can choose which narrative paths he/she wants to follow, and in all cases the video informs on and promotes object libraries, while allowing access to supplementary materials on notions like mutualization and lists of object libraries in different countries.


[The video](#) was evaluated by scientific colleagues and students through an open-ended questionnaire in France and Belgium. The answers were analysed qualitatively and were presented at a scientific seminar at Aarhus University (2-3 November 2023); a publication is scheduled on the results in 2025. The first analysis showed that video can be useful to inform, raise awareness and create engagement on object libraries. Different respondents shared the interpretation of the video, while differing in the evaluation of some aspects like speed and length. The interactive narrative structure appears effective to attire and keep the attention of the public. These results should be confirmed by a larger test with quantitative approaches. From a critical point of view, the video shows its limits: it does not question the values of the public, in particular egoistic values and systemic problems. The narrative universe is depoliticized, and creates just a marginal change inside a quite stable cognitive system, just focusing attention on renting and borrowing without radically putting into question the whole economic and cultural system. Contacts to spread the video among object libraries are being made in May and June 2024.

D.3.2 Narrative video: "Greenypill"

The second video was produced in collaboration with the expert of climate issues Rebecca Thyssen (CLimate Action Network), and prof. Olivier De Schutter. The objective was to work on climate engagement in a context of growing ecoanxiety, exploring the theme of political commitment and active participation in issues relating to CC and ecology. It is well known, as Olivier de Schutter reminded us, that the best way to escape from eco-anxiety is action and engagement in a collective way. This video was produced as a prototype (a sort of experimental piece of work), with a single narrative path that presents an alternative between an imaginary form of individual escape, represented by the "greenypill" (a reminder of the "blue pill" of the Matrix movies) and collective engagement. This video was aimed to be short, dynamic and captivating, in connection with the visual codes of nowadays digital culture, and becoming a satire of advertisement, hedonism, and

consumerism. The young lady in the video is firstly seduced by the perspective of forgetting all sorts of anxiety with the greenypill, as it is proposed by a very persuasive voice off. But the video shows her evolution, and her final decision to free herself from the pill and opt instead for action, represented by a series of scenes of demonstrations, protests, clean-up actions and environmental protection.
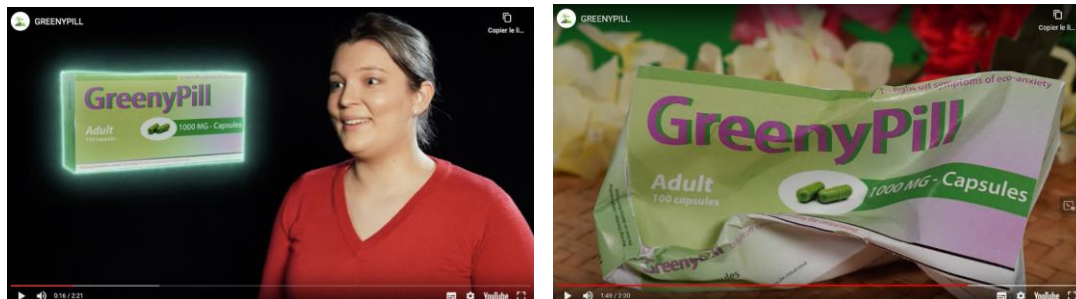
The video, which is certainly more "politicised" than the previous one, was tested by qualitative analysis of open-ended written questions too. A first analysis of answers (12) reveals that a part of people claims to have been emotionally affected; from a cognitive point of view, the message of the video seems to be globally understood. Like in the previous video, criticism concerns the length of the video. Another criticism concerns the lack of clear information on how to put it into practice, which is a sign of the importance of supporting the process of engagement. More research would be needed to better understand the reception of the video.

D.3.3 Participative, crowdsourced videos

In January 2024, we launched an experiment with 80 Master's students from UCLouvain. The objective was to cocreate, through social media, videos around 8 themes that were defined as the 8 challenges highlighted by the 2O2CM project's multidisciplinary team. Each student had to choose a theme, to construct a narrative about the theme and to divide the narrative into 10 stories that would be sent to the project's Instagram account.
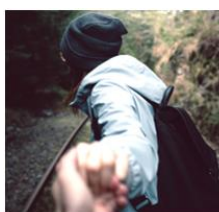
(1) To fight or to leave the fight?

(2) Who is responsible?

(3) Better Together!

(4) The earth as a job

(5) Climate & Social Justice

(6) The informational bias

(7) The future of earth

(8) Transition jobs

We received 10 stories about 80 subjects, but only 36 of them were used due to ethical reasons (consent, minor consent, image specificities…). 360 stories were then made available to create participative videos.

First we looked into the variety of discursive perspectives, of technical modes and of content structures that were used by the students in the videos. This analysis highlighted the information flow, the essential role of the text over the image, and the key role of music as a mediator of the stories. Then, we analysed the themes and the protagonists that were depicted: a typology of disincentives and motivational arguments emerge from this study, both from the students and from the protagonists interviewed. Lately, we started to merge the stories, in order to mix the perspectives, to offer a series of challenges and solutions, and even to serve as role modelling. We plan to create 10 participative videos from this fusion and to evaluate the result, notably to test the efficiency of participative infrastructures for NGOs communication campaigns.

5. DISSEMINATION AND VALORISATION

Concerning **communication tools**, a website has been created, to host all data and outputs of the project, and we distributed 4 issues of a newsletter to a list of contacts. We also defined a logo of the project.

The publication of scientific reports has been announced on digital social networks.

Our research teams have worked in **collaboration** with different groups and organisations, and organised or participated in different **external events and activities**.

The 2O2CM **Belgian team** has been working in collaboration with different partners. Our main non-academic partners have been: the cooperative Usitoo in Brussels, whose director Mr. Marichal helped us a lot in producing the first video dedicated to object libraries; the NGO CNCD 11.11.11 and in particular Ms Rebecca Thyssen, who helped us concerning the main goals of our project and the second video on engagement in particular. We collaborate also with the *Seniors4Climate* project, the *Youth, Communication and Climate* project and the organisation *Parlons Climat* France (meetings have been organised in 2022 and 2024). We also had a meeting on December 12, 2022, with an accompanying committee formed by Prof. Jean-Pascal van Ypersele (climatologist), M. Gilles Toussaint (journalist at La Libre Belgique), Rebecca Thyssen, Xavier Marichal, and different members of the Belgian Federal administration. The meeting was useful to prepare the final part of the work. The major event organised by the Belgian team has been the final scientific conference (see later).

On their side, the **French team** has worked in connection with the management of the Réserve Naturelle de Chastreix-Sancy, and organised meetings and activities in collaboration with them and discussed the levers to face the existing problems on the site concerning the users' environmental

attitudes. Rose Harrington (PhD student of the project) participated in the Fête de la Science organised by the University of Clermont Auvergne and Lyon Lumière (October 7-17, 2022) to present the first results of her thesis and to raise awareness among the young public about CC and the collective and individual levers to face it. The objective of this event is to organise meetings between the general public and the actors of science and technology in order to promote scientific and technical culture and to encourage exchanges between science and society. She also participated in an event called "women in sciences", in June 2022, to present to high school students her PhD results. The aim of this event was to give different examples of what research women are participating in at the University of Clermont Auvergne. There were PhD students of multiple fields (biology, physics, literature and psychology).

The **Norwegian team** has been working in connection with the public library in Bergen, and Bergen Global, a forum for research and debate on global challenges. In October 2022, Øyvind Gjerstad gave a public lecture about the Norwegian Citizen Panel survey at the library. The lecture has also been published as a podcast. In November 2022, Gjerstad moderated a discussion between philosophers and rhetoricians at Bergen Global. The topic was humanity's failure to effectively curb greenhouse gas emissions. In March 2024, the Norwegian team organised two seminars in collaboration with the Vestland regional authorities. The participants represented municipal administrations across the region. In the seminars we presented the results of our project and discussed their implications for climate and environmental governance at both municipal and regional levels.

The main element of our politics of valorisation and dissemination has been the hybrid (online and on site) **final conference**, organised in Louvain-la-Neuve and online on May 23 and 24, 2024. This event saw the presentation of 42 scientific papers, two keynote speeches (prof. Elodie Vargas from France, prof. Linda Steg from the Netherlands), 5 posters, and a roundtable with 4 experts from Belgian NGOs. We promoted this event in different ways, in particular via mailing lists and digital social media, in order to reach both the academic public and other people interested in the subject. We had more than 300 registrations, counting together people online and on site, from different continents (Africa, America, Europe in particular), and at least 171 people effectively present or connected during the two days of the conference.

The conference was supported also by the COST project SHIFT, which funded the participation of a young researcher from Portugal, and was labelled as Satellite Event of the European Climate Pact. It was an opportunity to present the results of the 2o2cm project, and it offered a space for the presentation of other research projects – in the field of human and social sciences – on transition aimed at mitigating CC and managing its inevitable effects. Papers focused on the analysis of obstacles and disincentives to actions and changes in favour of CC mitigation and adaptation, and the research of ways and solutions to fight against these obstacles. It was a really interdisciplinary conference, with strong representation of linguistics, psychology, communication science, education science, and philosophy. Interdisciplinary approaches were also well represented.

The conference included a roundtable with representatives of important associations active in Belgium to promote climate friendly behaviours and engagement: Greenpeace, Ecoconso, Canopea (the federation of Belgian environmental associations, regrouping 130 associations), and Empreintes. They discussed concrete obstacles and solutions for the promotion of a real change with each other and with the public. Keynote speakers, prof. Linda Steg and Elodie Vargas, enriched the conference with their linguistic and psychological approaches. The conference has been an occasion of

networking, exchange and mutual enrichment, and a means of raising the profile of the project and making it known to a variety of publics.

Future developments

A publication is scheduled after the conference, with the aim of collecting many different contributions from different human and social sciences concerning obstacles and solutions for pro-environmental and pro-climate behaviours. We will also make available visual and video materials of the event.

Concerning the video projects, we are in touch with object libraries and repair café organisations, in order to spread the word about the interactive video and make it known to organisations which could use it for their communication. The three videos were largely promoted during the conference.

A series of scientific publications is scheduled after the end of the program, concerning 1) the analysis of open-ended answers to surveys in Belgium and Norway, 2) the analysis of the meaning of the expression "sustainable development" in the three countries, basing on the Twitter (X) corpus, 3) the analysis of the video projects, and 4) the anthropological inquiry in France.

Another important output of the project is the 2 PhD theses, in communication science and psychology, that were made possible by the funding and which largely enriched the program and its results, and which will be defended in June 2024.

The 2o2cm project has been an important experience for the PIs and the collaborators and partners. New links have been established. It was an important experience concerning the management of an international consortium in turbulent times (in particular, COVID-19, the invasion of Ukraine and inflation). We had to adapt and find different ways of operating. Our 3 research teams will continue to collaborate and look for new opportunities of collaboration to contribute to the understanding of discourses and social dynamics concerning CC and environmental issues.

6. PUBLICATIONS

6.1 Corpora (data collections available for new research)

Pizarro Pedraza, Andrea; Catellani, Andrea; Samofalova, Yuliya, & Cougnon, Louise-Amélie (2022), *European Twitter corpus about Climate Change*, Dataset Publication, Open Data @ UCLouvain [online] https://doi.org/10.14428/DVN/4ONWW7 (14 October 2022).

Samofalova, Yuliya; Catellani, Andrea; Pizarro Pedraza, Andrea; Cougnon, Louise-Amélie (2022), *Instagram publications from Climate Change Opinion Leading Organizations in Belgium, France, and Norway*, Dataset Publication, Open Data @ UCLouvain [online] https://doi.org/10.14428/DVN/EIHK90 (3 November 2022).

Samofalova, Yuliya; Catellani, Andrea; Pizarro Pedraza, Andrea; Cougnon, Louise-Amélie (2023), *Instagram publications from 73 accounts of climate change opinion leaders in Belgium, France, and Norway*, Dataset publication, Open Data @ UCLOuvain [online] https://doi.org/10.14428/DVN/K2QOVS (1 February 2023).

Samofalova, Yuliya; Catellani, Andrea; Pizarro Pedraza, Andrea; Cougnon, Louise-Amélie (2023), *Multi-platform corpora of social media posts by climate change opinion leading organizations in Belgium, France, and Norway*, Dataset Publication, Open Data @ UCLouvain [online] https://doi.org/10.14428/DVN/GGOXOS (1 February, 2023).

Samofalova, Yuliya; Catellani, Andrea; Pizarro Pedraza, Andrea; Cougnon, Louise-Amélie (2023), *Multi-platform corpora of messages by climate change opinion leaders in Belgium, France, and Norway*, Dataset Publication, Open Data @ UCLouvain [online] https://doi.org/10.14428/DVN/VHQKIN (1 February 2023).

6.2 Reports and manuals

Pizarro Pedraza, A., Cougnon, L.-A., Catellani, A., Samofalova, Y., & De Schutter, O. (2022, November 12). *Climate change and Twitter in Belgium*. https://doi.org/10.31235/osf.io/m67dj

Report from a research project linked to 2o2cm: Ducol, L., Anciaux, A., Catellani, A., Lits, G., Galand, B., Nils, F., Rihoux, B. & Cougnon, L.-A. (2022). *Jeunes, Communication & Climat. Diversité des enjeux climatiques auprès des 15-24 ans en Belgique*. Rapport de l'UCLouvain, suite à un appel du Conseil fédéral pour le développement durable, SocArXiv, doi : 10.31235/osf.io/87psm

See also the manuals concerning how to use the videos on the page https://change4climate.eu/toolbox/manuals/

6.3 Doctoral thesis

Harrington, R. (June, 2024). *L'influence d'un écart perçu entre soi-autrui dans le changement social en matière de comportements pro-environnementaux*. Thèse de doctorat non publiée (249 p.). Université Clermont Auvergne.

Samofalova, Y. (June, 2024). *Communicating about climate change mitigation on social media. Multimodal analysis of Instagram posts by Belgian, French, and Norwegian opinion-leading individuals and organizations.* Thèse de doctorat non publiée (504 p.). Université catholique de Louvain.

6.4 Articles and book chapters, oral or poster presentations

The list presents all publications made by authors of this report that are close to the themes of the research project. Publications in bold are directly related to the project.

- Catellani, A., & Lits, G. (Eds.). (2024). *Transitions en tension: Controverses et tensions autour des transitions écologiques*. ISTE editions.
  https://www.istegroup.com/fr/produit/transitions-en-tension/

- **Fløttum, K., Dahl, T., Scheurer, J. (2024). 'Trying (hard), but it's difficult': Youth voices on lifestyle matters in a climate perspective. In: Svendsen, B. A., Jonsson, R. (Eds),** *The Routledge Handbook on Language & Youth Culture.* **London and New York, Routledge, 392-406.**

- **Harrington, R., Cougnon, L. A., Catellani, A., & Nugier, A. (2024). Vieillir vert et digitalisé: connaissances et habitudes pro-environnementales de Belges de plus de 60 ans dans une société digitalisée.** *VertigO - la revue électronique en sciences de l'environnement*, *23*(3), **https://doi.org/10.4000/11pd9**

- **Harrington, R., Cougnon, L. A., Catellani, A., & Nugier, A. (July, 2024).** *Vieillir vert et digitalisé: connaissances et habitudes pro-environnementales de Belges de plus de 60 ans dans une société digitalisée.* **[Poster presentation]. 15eme Congrès International de Psychologie Sociale.** *ADRIPS. Bruxelles.*

- **Harrington, R., Nugier, A., Khamzina, K., Cougnon, L-A., Bonneterre, S., Streith, M., Samofalova, Y. (Forthcoming) Le changement climatique : que faire ? Une approche psychosociale de l'action collective [Manuscrit soumis pour publication-In Mind].**

- **Harrington, R., Nugier, A., & Streith, M. (2024, May 23th – 24th)** *Attitudes and norms: conformity and resistance - Results from my PhD.* **[Conference presentation]. Overcoming obstacles to climate change mitigation conference, Louvain-La-Neuve, Belgique.**

- **Nugier, A., Harrington, R., Catellani, A.., Streith, M., Samofalova, Y, Cougnon, L-A. (Forthcoming). Le changement climatique : Apport de l'interdisciplinarité et outils de communication. [Manuscrit en préparation pour publication-In Mind].**

- **Nugier, A., Harrington, R., Streith, M. (2024, May 23th – 24th). Attitude et Normes : conformisme et résistance [Conference presentation]. Overcoming obstacles to climate change mitigation conference, Louvain-La-Neuve, Belgique.**

- **Oloko, F., Gjerstad, Ø., Fløttum, K. (2024). Les controverses du changement climatique en France et en Norvège. Une analyse thématique et polyphonique. In Birkelund, M. & Fernández, S.** *Nouvelles tendances de la romanistique scandinave*. **386-405. Aarhus: Aarhus University Library, https://doi.org/10.7146/aul.522.c277**

- **Samofalova, Y. (2024). Strategies and challenges for constructing and collecting visual corpora from image-based social media platforms. *Studies in Communication Sciences*, 1–16. https://doi.org/10.24434/j.scoms.2024.01.3881**

- **Samofalova, Y., Catellani, A., & Cougnon, L.-A. (Forthcoming). Youth climate activists' practices on social media in Belgium and France. In: von Mering, S. (Eds), The *Routledge Handbook of Grassroots Climate Activism*. Routledge.**

- **Streith, M. (Forthcoming). Appropriations subjectives du changement climatique.**

2023

- **Anciaux, A.; Cougnon, L.-A.; Ducol, L.; Catellani, A. (2023). Youth, Communication & Climate: A Pluridisciplinary Analysis of Distancing Strategies in Response to Climate Change among Belgian Youth. Youth 2023, 3, 1150-1173. https://doi.org/10.3390/youth3040073**

- **Bazantay, C., Voland, L., Harrington, R., & Lirot, H. (2023, Octobre 7). Ludothèque scientifique. *Organisé par Doct'Auvergne et l'université Clermont Auvergne,* au sommet du Puy de dôme, France [oral presentation]. https://www.uca.fr/recherche/sciences-et-societe/jeune-public/fete-de-la-science/la-fete-de-la-science-en-auvergne**

- Ducol, L., Cougnon, L.-A., Anciaux, A., Catellani, A., Lits, G., Nils, F., Galand B., & Rihoux, B. (2023, May 9). Young & Diversified: A segmented analysis of Young People's Profiles related to Climate Change Action [Conference presentation]. Living with Climate Change. International, cross-disciplinary conference, Bergen, Norway. https://www.uib.no/sites/w3.uib.no/files/attachments/climlife_book_of_abstracts.pdf

- **Fløttum, K. (2023, January 9). Climate, language, stories and sustainability [Guest lecture]. Conference on "Interdisciplinarity and Expert Disagreement on Sustainability". Norwegian University of Life Sciences (NMBU), Ås, Norway.**

- **____. (2023, June 12 – June 13). Narrative roles of citizens in the climate "battle": French survey of people's opinions on possibilities for and obstacles to climate action [Seminar]. Narratives in the humanities and social sciences.**

- **____. (2023). Rôles des citoyens dans la lutte climatique : une étude linguistique des opinions des Français sur les possibilités et les obstacles concernant l'atténuation du changement climatique. *Studii de lingvistică* 2023, (13) 2. https://studiidelingvistica.uoradea.ro/arhiva-en-13-2-2023.html**

- **____. (2023, June 13). Young citizens' opinions about and attitudes towards climate change, lifestyle and political influence – research in and outside the classroom [International PhD-course]. BSRS, Bergen, Norway.**

- ____. (2023, February 10). Å forske på klimanarrativer (To do research on climate narratives) [Conference presentation]. Høgskulen på Vestlandet HVL, Bergen, Norway.

- **Fløttum, K., Dahl, T. (2023). The climate communicator's challenge: What words and arguments motivate citizens to lifestyle change? Conference presentation, ALAPP - International conference, Glasgow.**

- Fløttum, K., Drange, H., Elgesem, D., Gjerstad, Ø., Andersen, I. V., Dahl, T. (2023, May 8 – May 9). CLIMLIFE project [Presentation of results]. International Conference "Living with climate change", Bergen, Norway.

- Gjerstad, Ø., Fløttum, K. (2023). Negation and Climate Change in French Blog Posts. In: Negatives and Meaning: Social Setting and Pragmatic Effects. Stockholm University Press. ISBN 978-91-7635-204-5. s. 27-42.

- **Harrington, R. & Nugier, A. (2023, May – June). Réplication conceptuelle de l'effet d'un mismatch "attitudes – normes sociales" sur des comportements écologiques individuels et collectifs [Conference presentation]. Crises climatiques, crises sociales, résilience et ruptures. The French Association for Research in Environmental Psychology (ARPEnv) and the LPS (Laboratoire de psychologie sociale, UR849), Aix-en-provence, France.**

- **Harrington, R., Nugier, A., Khamzina, K., Guimond, S., & Monceau, S. (2023 – June 30th – July 4th) The role of a "self-other" mismatch in motivating individuals to participate in social change and act pro-environmentally. In R. Harrington & M. Chevrier (chairs),** *The importance of having individual and group-level of analysis for a better understanding on how to fight climate change.* **[Symposium, oral presentation]. EASP 2023 General Meeting, Krakow, Pologne.**

- **Harrington, R. & Nugier, A. (2023, May – June).** *Réplication conceptuelle de l'effet d'un mismatch "attitudes – normes sociales" sur des comportements écologiques individuels et collectifs* **[Conference presentation]. Crises climatiques, crises sociales, résilience et ruptures. The French Association for Research in Environmental Psychology (ARPEnv) and the LPS (Laboratoire de psychologie sociale, UR849), Aix-en-provence, France.**

- Harrington, R. & Ferreira, S. (2023, Mai 24). *Séance de thérapie 1 : « Je suis une science » & Séance de thérapie 2 : "J'ai ma place en tant que science dans la société"* in Psychologie expérimentale. *Pint of Science*, Clermont-Ferrand, France [oral presentation]. https://pintofscience.fr/events/clermont-ferrand

- **Harrington, R., Nugier, A., & Streith, M. (2023, January).** *Réplication conceptuelle de l'effet mismatch sur les comportements écologiques***. [Oral presentation] In Small meetings d'hiver n°2, Clermont-Ferrand, France.**

- Khamzina, K., Streith, M., Guimond S., & Dernat, S. (2023). Dynamiques entre attitudes personnelles et normes sociales perçues dans les comportements de changement. Le cas de la conversion biologique. *Natures Sciences Sociétés 31, 1,* <64-74. hppps://doi.org/10.1051/nss/2023022>

- **Samofalova, Y. (2023, April 14). Tendencies in studying climate change communication in social sciences and humanities [Conference presentation]. International scientific and**

Practical conference "YOUTH AND SCIENCE: YOUTH A NEW VISION AND DIALECTIC OF DEVELOPMENT". Karaganda University of Kazpotrebsoyuz, Karaganda, Kazakhstan.

- **Samofalova, Y., Catellani, A., & Cougnon, L.-A. (2023, May 9). Environmental values in climate change digital communication: The case of Belgian and French Youth for Climate movements on Instagram and TikTok [Conference presentation]. Living with Climate Change. International, cross-disciplinary conference, Bergen, Norway. https://www.uib.no/sites/w3.uib.no/files/attachments/climlife_book_of_abstracts.pdf**

- **———. (2023, November 23-24). Manger moins de viande ou consommer plus de légumes et céréales ? Analyse des discours en ligne des ONG et mouvements environnementalistes français sur leurs actions climatiques autour de la consommation de viande et des commentaires des internautes [Conference presentation]. Vent debout. Dynamiques communicationnelles, mobilisations écologiques et participations citoyennes contemporaines, colloque international, Paris, France.**

- **Samofalova, Y., & Marcella V. (2023, November 22-24). Framing European youth climate movements on Instagram: a comparative case study of main youth climate movements in Belgium, France, and Italy [Conference presentation]. Clavier 2023. Framing nature: discourses past and present of nature and the environment. A sustainability perspective. University of Milan, Milan, Italy. Book of abstracts.**

- Wiig, H., Fløttum, K. (2023, January 12). «Nevn ikke Greta!» («Don't mention Greta!») [Interview]. Besteforeldrenes klimaaksjon [Grandparents' climate action], Internet. https://www.besteforeldreaksjonen.no/2023/01/nevn-ikke-greta-thunberg/

2022

- Andersen, Ida Vikøren; Fløttum, Kjersti.2022. "Adults who fail the next generations and children who refuse to give up": The story about climate change as a battle between the generations. In: Fridays for Future: Sprachliche Perspektiven auf eine globale Bewegung. Narr Francke Attempto Verlag. ISBN 978-3-8233-8511-0. p. 17-35

- **Badiang Oloko, F., Gjerstad, Ø., Fløttum, K. (2022). Les controverses du changement climatique en France et en Norvège : une analyse thématique et polyphonique. Presentation at the 21st Nordic Romanist Conference, 16-19 August 2022.**

- Catellani, A. (2022). Semiotic analysis of environmental communication campaigns. In The Routledge Handbook of Nonprofit Communication. Routledge.

- Catellani, A. (2022). Signes, sens et environnement. Questions de communication, 41, Article 41. https://doi.org/10.4000/questionsdecommunication.28863

- **Deffuant, G., Roozmand, O., Huet, S., Khamzina, K., Nugier, A., Guimond, S. (2022). Can biases in perceived attitudes explain anti-conformism ? in IEEE Transactions on Computational Social Systems, https://doi.org/10.1109/TCSS.2022.3154034**

- Ducol, L., Anciaux, A., Catellani, A., Lits, G., Galand, B., Nils, F., Rihoux, B. & Cougnon, L.-A. (2022). Jeunes, Communication & Climat. Diversité des enjeux climatiques auprès des 15-24 ans en Belgique. Rapport de l'UCLouvain, suite à un appel du Conseil fédéral pour le développement durable, SocArXiv, doi : 10.31235/osf.io/87psm

- Fløttum, K., Dankel, D.J., Skiple, J.K. (2022). The Sustainable Development Goals — Sensible Initiative or Just Nonsense? An Investigation of Norwegian Citizens' Knowledge and Attitudes. Sustainability 2022, 14(7), 4305; https://doi.org/10.3390/su14074305.

- Fløttum, K., Gjerstad, Ø., Badiang Oloko, F. (2022). De la polyphonie linguistique à la polyphonie discursive : un chemin à trois étapes. Cahiers de praxématique, 76, https://doi.org/10.4000/praxematique.7413.

- Gjerstad, Ø., Fløttum, K. (2022). From Descriptive to Normative Climate Change Narratives: Theoretical and Methodological Challenges. Oxford Research Encyclopedia of Climate Science. Oxford University Press.

- **Harrington, R., Nugier, A., Khamzina, K., Guimond, S., Monceau, S., and Streith, M. (2022). Understanding individual and collective response to climate change: The role of a self-other mismatch. Front. Psychol. 13:935209. doi: 10.3389/fpsyg.2022.935209**

- **Harrington, R. (2022, Oct, 13). Influence normative, menace environnementale et attitudes liées au changement climatique. Mini-conférence organisées dans le cadre de la conférence d'ouverture de la Fête de la science (UCA) : "Changement climatique : que font les chercheurs ?". [oral presentation]. Université Clermont Auvergne, 7 -17 Octobre.**

- **Harrington R. (2022, Oct. 3) L'Apport de la psychologie sociale in « Changement climatique : que font les chercheurs ? » [oral presentation]. Fête de la science, Université Lumière Lyon 2, France**

- **Harrington, R. (2022, Juin 7) Que font les femmes en science ? Mon exemple : la psychologie sociale [oral presentation]. Clermont Ferrand, France.**

- **Harrington, R., Nugier, A., Guimond, S., Streith, M. & Monceau, S. (2022, Jan, 26-28, Pre-registred communication). How does a mismatch between norms and attitude affect your pro-environmental intentions to eat less meat? [oral presentation]. RKTS Workshop: An EASP Community of Environmental Social Psychologists. Université de Koblenz-Landau-Germany. 26-28 Janvier.**

- **Harrington, R., Streith, M., Guimond, S., Khamzina, K., Monceau, S., & Nugier, A. (2022, Sept, 5-9). How does a "norms – attitude" mismatch influence pro-environmental intentions? Summer school on Individual and Collective actions for the Ecological Transition (SICET) organised by the Laboratory of Applied Psychology and Ergonomics (LaPEA, Université Gustave Eiffel, Université Paris Cité Cité), the French Association for Research in Environmental Psychology (ARPEnv) and the Learning Planet Institute (LPI). SICET, Paris, France.**

- **Harrington, R., Streith, M., Guimond, S., Khamzina, K. Monceau, S. & Nugier, A. (2022, July, 11-13). Comment un écart entre l'attitude et les normes sociales influence les intentions pro- environnementales ? [oral presentation]. 14eme Congrès international en langue française (CIPSLF) organisé par Association pour la Diffusion de la Recherche Internationale en Psychologie Sociale (CIPSLF-ADRIPS), Bordeaux, France.**

- **Luders, A., Wollast, R., Nugier, A. & Guimond, S. (2022). You are what you eat! Self-serving information selection polarizes debates about meat consumption to combat climate change. Appetite, 170, 105877. https://doi.org/10.1016/J.APPET.2021.105877**

- Marcella, V., & Samofalova, Y. (2022). Data-driven and research-based learning approaches to environmental education in university contexts: Two case studies in Italy and Germany.

Language Learning in Higher Education, 12(2), 567–586. https://doi.org/10.1515/cercles-2022-2064

- **Pizarro Pedraza, A., Cougnon, L.-A., Catellani, A., Samofalova, Y., & De Schutter, O. (2022, November 12). Climate change and Twitter in Belgium. https://doi.org/10.31235/osf.io/m67dj**

- **Samofalova, Y. (2022, August). Collecte de corpus multimodaux à partir de réseaux socionumériques : Stratégies et défis méthodologiques. Presented at the Journées doctorales en Sciences de l'information et de la communication, Université libre de Bruxelles.**

- **Samofalova, Y. (2022, November 25). L'éducation à l'environnement par l'apprentissage par la recherche dans un contexte universitaire : le cas de Q-Teams à HU Berlin. Presented at Conférence sur la recherche interdisciplinaire et transdisciplinaire « Transition et Développement Durable », Louvain-la-Neuve, November 26.**

2021

- Andersen, G., Fløttum, K., Carbou, G., and Müller, G. A. (2021). "People's Conceptions and Valuations of Nature in the Context of Climate Change." Environmental Values 30 (1). https://doi.org/10.3197/096327121X16328186623850.

- Catellani, A. (2021). "Changement Climatique : Déni, Négation et Climato-Scepticisme." In Publictionnaire. Dictionnaire Encyclopédique et Critique Des Publics. http://publictionnaire.huma-num.fr/notice/changement-climatique-deni-negation-et-climato-scepticisme.

- Catellani, A., and Pascual Espuny, C. (eds.) (2021). Environnement, Nature et Communication à l'ère de l'anthropocène. Revue Française Des Sciences de l'information et de La Communication 21. https://journals.openedition.org/rfsic/9995.

- **David, L., Dambrun, M. Harrington, R., Streith, M., & Michaud, A. (2021). Psychological and Physical Health of Organic and Conventional Farmers: A Review. Sustainability 13. https://doi.org/10.3390/su132011384.**

- De Schutter, O., and Dedeurwaerdere, T. (2021). Social Innovation in the Service of Ecological and Social Transformation. The Rise of the Enabling State. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9781003223542/social-innovation-service-social-ecological-transformation-olivier-de-schutter-tom-dedeurwaerdere.

- Fløttum, K. (2021a). "Genre Differences, Polyphony and Role Attribution in Climate Change Narratives." Keynote presented at the Climate Change Temporalities.

- ———. (2021b). "Ord Og Stemmer I Klimadebatten. [Words and Voices in the Climate Debate]." REPLIKK – Tidsskrift for Samfunnsvitskap Og Humaniora, 2021.

- ———. (2021c). "Représentation Linguistique de l'avenir Dans Des Blogs Climatiques Francophones." Presented at the COMMUNICATION ET RISQUES CLIMATIQUES, Académie des controverses et de la communication sensible, March 16.

- ———. (2021d). "Klima Og Ungdom [Climate and Youth]: Holdninger Til Medborgerskap/Demokrati Og Bærekraft." Presented at the Bergen Municipality, Climate section, Seminar on new climate strategy, Bergen, June 10.

- ———. (2021e). "Citizen Opinions about Authorities' (Lack of) Facilitation of Climate-Friendly Lifestyle Choices." Presented at the DIGSSCORE seminar, April 13.

- Fløttum, K., Trine, D., and Scheurer, J. P. (2021). "RAPPORT – CLIMLIFE-SKOLEUNDERSØKELSE OM DE UNGES PERSPEKTIV PÅ KLIMA OG LEVEMÅTE. [CLIMLIFE School Survey on Young People's Perspective on Climate and Lifestyle]." Bergen: Department of foreign languages, University of Bergen. https://www.uib.no/en/rg/lingclim/146372/research-report-%E2%80%93-climlife-school-survey-young-peoples-perspective-climate-and.

- Fløttum, K., Gjerstad, Ø., and Müller, G. A. (2021). "Natur Og Menneske i et Språklig Klimaperspektiv. [Nature and Humans in a Linguistic Climate Perspective]." Oslo Studies in Language (OSLa) 12 (1): 39–60.

- Fløttum, K., Gjerstad, Ø., and Skiple, J. K. (2021). "Climate Change and Lifestyle: People's Expressed Motivations to Adopt or Not Adopt a Climate-Friendly Way of Life." ASp 79: 75–94.

- Fløttum, K., Scheurer, J. P., Andersen, I. V., Falck, R., and Lygren, S. H. (2021). "Unge Bergenseres Syn På Klimaendringer, Livsstil, Skam Og Pandemien [Views of Young People in Bergen on Climate Change, Lifestyle, Shame and the Pandemic]." Presented at the CLIMATE FESTIVAL, House of Litterature, Bergen, July 6.

- Gjerstad, Ø. (2021a). 30-08/03-90-21. "Political and Societal Narratives from a Linguistic Perspective: A Linguistic Analysis of the Lausanne Movement's Cape Town Commitment." Presented at the 18th Annual Conference of the European Association for the Study of Religions, Pisa. August 30-September 3.

- ———. (2021b). "Narrative Structures in Argumentation: A Linguistic Approach to the Study of Religious and Societal Narratives." Presented at the International seminar on narrative sociology, Rome, May 10.

- **Gjerstad, Ø., and Fløttum, K. (2021). "Climate Change Lifestyle Narratives among Norwegian Citizens: A Linguistic Analysis of Survey Discourse." European Policy Analysis, 1–18.**

- **Harrington, R., Nugier, A., Guimond, S. & Streith, M. (2021, Nov, 19). How does a mismatch between norms and attitude affect your pro-environmental intentions to eat less meat? [oral presentation]. 16eme Journée Scientifique des Jeunes Chercheurs. JSJC, AFPSA; PSITEC; SCALab. Lille, France.**

- **Harrington, R., Streith, M., Guimond, S., Khamzina, K., Monceau, S., & Nugier, A. (2021, December). How does a mismatch between norms and attitude affect your pro-environmental intentions to eat less meat? [Oral presentation] In Small meetings d'hiver n°1, Clermont-Ferrand, France.**

- **Harrington, R., & Monceau, S. (2021, Octobre, 7) La détection des émotions en psychologie [Oral presentation]. Fête de la science, Université Clermont Auvergne, France Khamzina, K., Huet, S., Deffuant, G., Streith, S., & Guimond. S. (2021). Making the planet green again: The Interplay of Attitudes and Group Norms in the Conversion to Organic Farming." Journal of Applied Social Psychology, 51(11), 1073-1088.**

- Oloko, F. (2021). Functions of bla, bla bla, in one Greta Thunberg speech: A linguistic analysis. Academia Letters, Article 4190. https://doi.org/10.20935/AL4190.

- **Samofalova, Y. (2021). "Humor types of Greenpeace memes on Instagram: multimodal analysis" Presented at the Bremen-Groningen Online Workshops on Multimodality, November 5.**

- **Samofalova, Y., Catellani, A., Cougnon Louise-Amélie. (2021a). "Nature 'Enrollment' in Climate Change Visual Communication: COP Official Accounts." Presented at the The 16th Conference on Communication and Environment "Re-MEDIAting the Wild", organized by IECA, International. June 21-24.**

- **———. (2021b). "Greenpeace Memes for Communicating Climate Change." Presented at the workshop Mots/Machines #3, Université de Bretagne Occidentale, March 3.**

- **———. (2021c). "L'implication de la nature dans la communication visuelle sur le changement climatique : évolution des stratégies communicationnelles des comptes officiels de COP sur Instagram". Poster presented at Journée d'études ILC Day 10+1, Louvain-la-Neuve, November 25.**

- **———. (2021d). "Implication de la nature dans la communication sur le changement climatique : analyse multimodale de l'évolution des stratégies communicationnelles des comptes officiels de COPs sur Instagram". Presented at Conférence sur la recherche interdisciplinaire et transdisciplinaire « Transition et Développement Durable », Louvain-la-Neuve, November 26.Streith, M. (2021). Apiculteurs en collectif. Travail, interactions, réflexivité. In Van Dam, D., Nizet, J., & Streith, M. (Eds.). Apiculteurs, Nature et Société, 91–108. Dijon: Éducagri Éditions.**

- Van Dam, D., Nizet, J., & Streith, M. (2021). Apiculteurs, Nature et Société. Dijon: Éducagri Éditions.

2020

- Catellani, A. (2020). "Rhétorique Environnementale." In Dictionnaire Critique de l'anthropocène, 728–32. CNRS Éditions. https://www.cnrseditions.fr/catalogue/societe/dictionnaire-critique-de-l-anthropocene/.
- Fløttum, K. (2020). "Il y a Héros et Héros: La Construction de Rôles Narratifs Dans Quelques Genres Du Discours Portant Sur Le Changement Climatique." Invited talk presented at the Comment parler d'environnement? Héros/hérauts et communication environnementale. https://ger-cess-2020.sciencesconf.org/. December 9-11.
- Streith, M. (2020). Rencontre Concrète Avec l'agroécologie : Entre Horizon Idéologique et Réalité Des Pratiques. In Christel Bosc et Medhi Arrignon (Dir.), Les Transitions Agroécologiques En France. Enjeux, Conditions et Modalités Du Changement, 197–210. Clermont-Ferrand: Presses Universitaires Blaise-Pascal.

7. ACKNOWLEDGEMENTS

ANNEXES

Bibliographic references

Ajzen, I. (1991). The theory of planned behavior, Organizational behavior and human decision processes, 50(2), pp. 179-211.

Barth, M., Masson, T., Fritsche, I., and Ziemer, C. T. (2018). Closing ranks: Ingroup norm conformity as a subtle response to threatening climate change, Group Processes & Intergroup Relations, 21(3), pp. 497-512.
de Boer, J., & Aiking, H. (2017). Pursuing a Low Meat Diet to Improve Both Health and Sustainability: How Can We Use the Frames that Shape Our Meals? *Ecological Economics*, *142*, 238–248. https://doi.org/10.1016/j.ecolecon.2017.06.037

Bouman, T., van der Werff, E., Perlaviciute, G., Steg, L. (2021). Environmental values and identities at the personal and group level, Current Opinion in Behavioral Sciences 2021, 42:47–53.

Catellani, A. (2017). Environmentalist Multimodal Communication: Semiotic Observations on Recent Campaigns, Sarah Roberts-Bowman and Simon Collister (eds), Visual & Spatial Public Relations: Strategic Communication Beyond Text, Routledge 2017.

Corner, A., Webster, R., & Teriete, C. (2015). *Climate Visuals: Seven principles for visual climate change communication (based on international social research)*. Oxford: Climate Outreach. Retrieved from Climate Outreach website: file:///C:/Users/samofalova/Downloads/Climate-Outreach-Climate-Visuals.pdf

Cougnon, L.-A., Coppin, J. and Gutierrez V. (2019). A Mixed Quantitative-Qualitative Approach to Disagreement in Online News Comments on Social Networking Sites. Proceedings of the 7th Conference on CMC and SMC for the Humanities, pp. 32-36.

Cougnon, L-A.& de Viron, L. (2021). Covid-19 et communication de crise. Focus linguistique sur les tweets francophones de Belgique. In Kamber, A., Cotelli Kureth, S, & Dubois, M.(éds). La linguistique appliquée à l'ère digitale, Bulletin vals-asla numéro spécial, volume 1.

Cougnon, L.-A., Maskens, L., Roekhaut, S. and Fairon, C. (2017). Social Media, Spontaneous Writing and Dictation. Spelling variation, Journal of French Language Studies, 27(3), Cambridge University Press, pp. 309-327.

Chen, S. (2016). Language and ecology: A content analysis of ecolinguistics as an emerging research field, Ampersand, 3, pp. 108-116.

Ferreira, M., Granado, A., Lopes, B., & Loureiro, J. (2023). Tools to communicate science: Looking for an effective video abstract in Ecology and Environmental Sciences. *Journal of Science Communication*, *22*(4), A07. https://doi.org/10.22323/2.22040207

Fløttum, K. (ed.). (2017). The Role of Language in the Climate Change Debate, New York, Londres, Routledge.

Fløttum, K. (2013). « A linguistic and discursive view on climate change discourse », ASp, la revue du GERAS, 58, 19-37.

Fløttum, K., and Gjerstad, Ø. (2017). Narratives in climate change discourse, WIREs Clim Change, 8:e429.

Fløttum, K., & Gjerstad, Ø. (2013). Arguing for climate policy through the linguistic construction of Narratives and voices: the case of the South-African green paper "National Climate Change Response". Climatic Change, 118(2), 417–430.

Fløttum, K. (2018). Linguistic analysis in climate change communication, Nisbet Matthew (ed.), The Oxford Encyclopedia of Climate Change Communication, Oxford, Oxford UP, 3, pp. 21-38.

Gifford R. (2011). The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation, The American psychologist, 66(4), pp. 290-302.

Guimond, S., et al. (2013). Diversity policy, social dominance, and intergroup relations: Predicting prejudice in changing social and political contexts, Journal of Personality and Social Psychology, 104(6), pp. 941.

Gutierrez Figueroa, Violeta ; Cougnon, Louise-Amélie. *Towards a typology of disagreement in online news comment on social networking sites.* In: Julien Longhi and Claudia Marinica, *CMC Corpora through the Prism of Digital Humanities*, L'Harmattan 2020, p. 35-54

Hansen, A. (2018). Methods for assessing visual images and depictions of climate change, Nisbet Matthew (ed.), 2018, The Oxford Encyclopedia of Climate Change Communication, 3, Oxford UP, pp. 112-126.

Khamzina, K. (2019). Conformisme ou dissidence ? Les implications psychologiques de l'incongruence entre les attitudes personnelles et la norme collective, PhD. Université Clermont Auvergne.

Kieffer, S., Rukonic, L., Kervyn de Meerendré, V. and Vanderdonckt, J. (2019). Specification of a UX process reference model towards the strategic planning of UX activities, Proceedings of the 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, 2, pp. 74-85.

Krieg-Planque, A. (2010). La formule "développement durable" : un opérateur de neutralisation de la conflictualité. Langage et société, 134(4), 5-29.

Lalot, F., Falomir-Pichastor, J. M., and Quiamzade, A. (2017). Compensation and consistency effects in proenvironmental behaviour: The moderating role of majority and minority support for proenvironmental values, Group Processes & Intergroup Relations, 21(3), pp. 403-421.

Marshall, G. (2015). Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change, London, Bloomsbury.

McHugh ML. Interrater reliability: the kappa statistic. Biochem Med (Zagreb). 2012;22(3):276-82. PMID: 23092060; PMCID: PMC3900052.

Moser, S. (2016). Reflections on climate change communication research and practice in the second decade of the 21st century: what more is there to say?, WIREs Climate Change, 7, pp. 345-369.

O'Neill, S., & Smith, N. (2014). Climate change and visual imagery. *WIREs Climate Change*, *5*(1), 73–87. https://doi.org/10.1002/wcc.249

Pearce, W., Niederer, S., Özkula, S. M., and Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. Wiley Interdisciplinary Reviews. Climate Change, 10(2).

Ribes, A., Boé, J., Qasmi, S., Dubuisson, B., Douville, H., and Terray, L. (2022). An updated assessment of past and future warming over France based on a regional observational constraint, Earth Syst. Dynam., 13, 1397–1415, https://doi.org/10.5194/esd-13-1397-2022.

Schäfer, M., & Xiaoyue, Y. (2023). News and social media imagery of climate change: Analyzing the role and impact of visuals in public communication. In Z. Baker, T. Law, M. Vardy, & S. Zehr (Eds.), Climate, Science and Society: A Primer (1st ed., pp. 66–73). London: Routledge. https://doi.org/10.4324/9781003409748

Steg, L . (2023). Psychology of Climate Change. Annu. Rev. Psychol. 74: 391–421.

Stoknes P. E. (2015). What We Think About When We Try Not to Think About Global Warming: Toward a New Psychology of Climate Action, White River Junction, Chelsea Green Publishing.

Streith, M. (2024-in. prep). Appropriations subjectives du changement climatique.

Terry, D. J., and Hogg, M. A. (1996). Group norms and the attitude-behavior relationship: A role for group identification, Personality and Social Psychology Bulletin, 22, pp. 776-793.

Verfuerth, C., Demski, C., Capstick, S., Whitmarsh, L., & Poortinga, W. (2023). 'A people-centred approach is needed to meet net zero goals'. Journal of the British Academy, 11(s4): 97–124. https://doi.org/10.5871/jba/011s4.097

Wong-Parodi G., and Feygina I. (2020, in press). Understanding and countering the motivated roots of climate change denial, Current Opinion in Environmental Sustainability.