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DOI: <https://doi.org/10.1093/isp/ekad004>

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-257917>

Journal Article

Published Version



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Originally published at:

Hirblinger, Andreas T; Wählisch, Martin; Keator, Kate; McNaboe, Chris; Duursma, Allard; Karlsrud, John; Sticher, Valerie; Verjee, Aly; Kyselova, Tetiana; Kwaja, Chris M A; Perera, Suda (2024). Forum: Making Peace with Un-Certainty: Reflections on the Role of Digital Technology in Peace Processes beyond the Data Hype. *International Studies Perspectives*, 25(2):185-225.

DOI: <https://doi.org/10.1093/isp/ekad004>

Forum: Making Peace with Un-Certainty: Reflections on the Role of Digital Technology in Peace Processes beyond the Data Hype

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Abstract: Recent years have seen the acceleration of data- and evidence-based approaches in support of peace processes, creating a renewed confidence that conflicts can be predicted, known, and resolved, based on objective information about the world. However, new technologies employed by conflict parties, stakeholders, and those who aim to make or build peace have also made peace processes less ascertainable, intelligible, and predictable. Technology can thus create both more certainty and uncertainty in (and about) peace processes. This forum article presents a first collaborative attempt to explore how the use of technology by conflict parties and peacebuilding actors influences these dynamics. We examine various fields of engagement, ranging from conflict prevention to peace mediation, peacekeeping, and longer-term peacebuilding. Our discussion engages with a variety of related activities, including predictive analysis and foresight, conflict analysis, cease-fire monitoring, early warning and early action, and problem-solving and trust-building dialogues. We suggest

Hirblinger, Andreas T. et al. (2023) Forum: Making Peace with Un-Certainty: Reflections on the Role of Digital Technology in Peace Processes beyond the Data Hype. *International Studies Perspectives*, <https://doi.org/10.1093/isp/ekad004>

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approaching *un-certainty* as a spectrum between uncertainty and certainty that can be studied across epistemic, ontological, and normative dimensions, thus inviting further academic research and policy reflection. The article is coauthored by scholars and current or former practitioners and underlines the necessity, benefits, and feasibility of research–practice exchanges on this topic.

Resumen: Durante los últimos años se ha podido observar un incremento de los enfoques basados en datos y en pruebas que tienen como fin el apoyo de los procesos de paz. Esto ha creado una confianza renovada en el hecho de que los conflictos pueden predecirse, conocerse y resolverse sobre la base de la información objetiva acerca del mundo. Sin embargo, las nuevas tecnologías empleadas por las partes en conflicto, por las partes involucradas y por aquellos que tienen como objetivo hacer o construir la paz también han provocado que los procesos de paz resulten más difíciles de discernir, así como menos inteligibles y menos predecibles. De esta forma, la tecnología puede crear, al mismo tiempo, más certezas e incertidumbres durante (y acerca de) los procesos de paz. Este artículo del foro presenta un primer intento de colaboración con el fin de explorar cómo el uso de la tecnología llevado a cabo por las partes en conflicto y por los agentes de consolidación de la paz influye en estas dinámicas. Estudiamos varias áreas de implicación, que van desde la prevención de conflictos a la mediación de paz, a la supervisión del alto el fuego, al mantenimiento de la paz y al diálogo a más largo plazo. Nuestro debate se centra en una variedad de actividades interrelacionadas, incluyendo: el análisis predictivo y la previsión, el análisis de conflictos, la vigilancia del alto el fuego, la alerta y la actuación tempranas, así como la resolución de problemas y los diálogos de fomento de la confianza. Sugerimos abordar la *incertidumbre* como un abanico de posibilidades entre la incertidumbre y la certeza que puede estudiarse a través de dimensiones epistémicas, ontológicas y normativas, de manera que invita a realizar una mayor investigación académica, así como una mayor reflexión política. Este artículo está escrito de forma conjunta por académicos y profesionales, tanto actuales como más antiguos, y recalca la necesidad, los beneficios y la viabilidad de los intercambios durante la práctica de la investigación sobre este tema.

Résumé: Récemment, nous avons assisté à une multiplication des approches fondées sur les données et les preuves pour soutenir les processus de paix. Cette tendance a renforcé le sentiment qu'il était possible de prédire les conflits, de les comprendre et de les résoudre, à partir d'informations objectives sur le monde. Toutefois, les nouvelles technologies employées par les parties des conflits, les intervenants et les entités qui veulent établir ou consolider la paix, ont rendu les processus de paix moins évaluable, compréhensible et prévisibles. Ainsi, la technologie peut à la fois renforcer et affaiblir le degré de certitude des processus de paix. Rédigé pour le forum, cet article présente une première tentative de collaboration qui s'intéresse aux conséquences de l'utilisation de la technologie par les parties d'un conflit et les acteurs de consolidation de la paix sur cette dynamique. Nous analysons plusieurs domaines d'intervention, de la prévention des conflits à la médiation de paix, en passant par le contrôle du cessez-le-feu, le maintien de la paix et le dialogue sur le long terme. Notre propos couvre un large éventail d'activités connexes, notamment l'analyse prédictive et les prévisions, l'analyse des conflits, le contrôle d'un cessez-le-feu, les alertes et les mesures précoces, ainsi que la résolution de problèmes et les dialogues visant à renforcer la confiance. Nous suggérons d'appréhender « l'incertitude » comme un spectre entre l'incertitude et la certitude, dont nous pouvons étudier les dimensions épistémiques, ontologiques et normatives, afin d'inciter à davantage de recherche académique et

de réflexion politique. Coécrit par des chercheurs et des professionnels en activité ou retraités, l'article souligne la nécessité, les avantages et la faisabilité des échanges entre la recherche et la pratique sur ce sujet.

Keywords: peacebuilding, peace processes, technology, data, uncertainty

Palabras clave: Consolidación de la paz, procesos de paz, tecnología, datos, incertidumbre

Mots clés: consolidation de la paix, processus de paix, technologie, données, incertitude

Introduction

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Recent years have seen the increased exploration of “new” or “digital” technologies for a variety of peace process–support activities, including conflict early warning, peace mediation, peacekeeping, and peacebuilding. This trend has coincided with an acceleration of data- and evidence-based approaches to preventing conflict and building peace, and a growing confidence that conflicts can be predicted, known, and resolved with increasing certainty, based on objective information about the world. However, the proliferation of digital technologies in conflict-affected contexts has also led to new uncertainties, for instance, due to the large amounts of data that are difficult to make sense of and use (Read, Taithe, and Mac Ginty 2016), new opportunities to fabricate information and spread disinformation (Schirch 2018), difficulties to assess the impact of algorithmically mediated information ecosystems (Gohdes 2018), and a global digital divide that leaves a considerable part of conflict-affected populations and their needs unaccounted for through digital means (Tellidis and Kappler 2016). This all hints to the fact that digital technologies can create more certainty and uncertainty in (and about) peace processes.

International organizations with conflict prevention and peacebuilding mandates have recently spearheaded a range of policy and practice initiatives to harness the power of digital technologies in their struggle against uncertainty. Importantly, such initiatives tend to acknowledge that digital technologies cannot only be a cure for, but also a cause of uncertainty. At the 2020 World Economic Forum, United Nations (UN) Secretary-General Antonio Guterres described the state of the world as characterized by “uncertainty” and “instability” and pointed to the “dark side of the technological revolution” as one of the principal causes of this condition (World Economic Forum 2020). Yet, his initiative on New Technologies, launched in 2018, aimed to increase the UN’s capacity to employ digital technologies to attain the Sustainable Development Goals (United Nations 2018). Moreover, the UN Secretary-General’s report on the 2020 Roadmap for Digital Cooperation stressed the need for digital inclusion as a basis for evidence-based policy-making to deal with contemporary challenges to peace and security (United Nations Secretary-General 2020). The UN’s departments and specialized agencies followed suit with more specific suggestions. In 2021, the UN launched a strategy for the digital transformation of peacekeeping, which calls for “data-driven approaches,” among others, for surveillance and reconnaissance, to collect evidence about atrocities against civilians, and

to measure the impact and performance of peacekeeping missions (United Nations 2021b). The UN Development Program (UNDP)'s Digital Strategy for 2022–2025 likewise stresses evidence-based decision-making and commits to improve “data usage” and “knowledge sharing” (UNDP 2022). Importantly, this trend is not limited to the UN and the multilateral system. For instance, nongovernmental partnerships such as the Alliance for Peacebuilding partner with initiatives such as the Better Evidence Project to advance methods for evidence-based peacebuilding programming and implementation (Seyle et al. 2021). Overall, these policy initiatives demonstrate a larger trend to identify the lack of sufficient credible information as a key hurdle for effective conflict prevention and peacebuilding, and consequently advocate to bolster efforts to employ digital technologies to overcome such information challenges.

It is an inherent feature of modernity that those in positions of political power will employ technology to attain certainty and, commonly so, to know and control the world they aim to govern. Peacebuilding and conflict prevention are not exception. However, in her reflections on the role of technology and scientific knowledge production in politics and public policy more broadly, Sheila Jasanoff (2007) pointed to how technologically derived knowledge remains always partial and insufficient when compared to the aspects of the world it claims to represent—which ultimately always appears more complex, ambiguous, and indetermined. The world of armed conflicts and peace processes is undoubtedly rife with such uncertainty, not only in relation to reliable knowledge of complex and often fluid conflict contexts and the conflict parties' preferences and actions, capabilities, and intents (Duursma 2018), but also in relation to the pathways for conflict settlement (Bell and Pospisil 2017). The digitalization of peacebuilding efforts¹ has made the role of technology in dealing with such uncertainties not only more pervasive and more profound, but also more inevitable. Digital technologies² have become both more ubiquitous, for instance, in the shape of everyday, “off-the-shelf” tools for communication and data collection, and more specialized, for instance, in the shape of tailor-made, artificial intelligence–supported methods for data gathering and analysis. Consequentially, they have also increasingly become indispensable and influential.

This forum article critically engages with the assumption that uncertainty in peace processes can simply be overcome through better data and evidence supplied with the help of digital technologies—and indeed, if seeking certainty is always necessary or even desirable. To this end, the authors aim to take the discussion of the merits and limits of technology beyond the data hype, by breaking with the assumption that more data, more information, and more evidence naturally lead to better outcomes. We do so by broadening our view on what conditions certainty and uncertainty, and by studying the interaction between technology and peacebuilding practices. The latter requires to move beyond a mere focus on technology toward a concern with sociotechnical relations, including not only how technologies are employed, but also what particular problems and solutions are attributed to them (Hirblinger et al. 2022). And the former requires to remain skeptical of the trend propagated by data- and evidence-driven approaches to view uncertainty primarily as a consequence of insufficient knowledge. Proponents of material semiotics have long argued that the epistemological concern with knowledge production cannot meaningfully be separated from ontological concerns with the enactment of reality,

¹Peacebuilding is an ill-defined term, yet it is commonly used to refer to external support to domestic processes that aim at preventing the occurrence or recurrence of armed conflict (Barnett et al. 2007). In this article, we include under the broad umbrella of peacebuilding activities such as conflict analysis and prediction, conflict early warning, peace mediation and dialogue efforts, peacekeeping operations, efforts strengthening public security and to maintain ceasefires, and efforts to promote reconciliation and political change (compare to Mross, Fiedler, and Gravingholt 2022).

²In the context of efforts to prevent and manage violent conflict, digital technologies have been commonly understood as web-based information and communication technologies (Mancini 2013).

and normative concerns with what is good or right to do (Law 2009, 155). Based on this insight, we are extending our discussion of the epistemic certainties or uncertainties produced through new or digital technologies, to include ontological and normative certainties and uncertainties and to ask how these three dimensions relate to one another.

Our article aims to foster a dialogue between policy, practice, and research on this important topic. Academic researchers do not just study the use of digital technologies in a detached way; they are often implicated in their development and application as well. Likewise, practitioners and policymakers do not simply employ digital technologies, but also help design them, and create information and knowledge through them that is used for academic research. Practitioners, policymakers, and academics are thus jointly implicated in the practices that shape the relationship between technology and uncertainty. This does not only produce tangible effects in armed conflicts and peace processes, but also affects how the wider discipline of international relations engages with this important topic.

How Technology Mediates Un-Certainty in Peace Processes

Each of the sections of this forum presents empirically grounded reflections on how the use of technology by conflict parties and peacebuilders influences the uncertainty that commonly characterizes peace processes. The authors aim to initiate a structured discussion of this topic by exploring various stages of peace processes and their related activities, ranging from predictive analytics and conflict analysis to cease-fire monitoring and civilian protection, to peace mediation, dialogue efforts, and bottom-up conflict transformation. This entails two principal theoretical maneuvers. First, we suggest thinking of *un-certainty* as a spectrum between uncertainty and certainty, emphasizing that these are two analytical ideals that are absent from lived experience. Second, we explore the relationship between un-certainty and technology along its epistemic, ontological, and normative dimensions. This typology does not claim to be final or all-encompassing but to encourage a more systematic exploration of the topic at hand. The remainder of this introduction aims to describe each of the dimensions of un-certainty more explicitly.

The Epistemic Dimension of Un-Certainty

Certainty is commonly understood as a state of knowing without doubt that something is the case (Reed 2011). Just as states and governments historically made great efforts to render intelligible the objects they aim to govern (Scott 1998), peacebuilding actors seek certainty, such as about the conflict parties and the relationships between them as well as the causes and dynamics of conflict. Data-driven approaches to peacebuilding tackle uncertainty primarily in epistemic terms, following an empiricist ambition of establishing correspondence between empirical data and information and the real world (Panic 2020). It is widely assumed that the more technologies can produce evidence—that is, proof that something is the case—the more they may help to provide a reliable basis to plan and implement peacebuilding and conflict-prevention measures (Wählich, this article). This thinking underpins most efforts to establish monitoring and evaluation systems that enable results-oriented interventions, and likewise the operations of peacekeeping missions. For instance, Big Data or satellite imagery may provide insights into remote areas of the world and allow for fine-grained analysis of correlations between a large number of events and factors (Karlsruh 2014; Duursma and Karlsruh 2019).

However, there commonly are difficulties with collecting or analyzing data due to linguistic diversity, limited infrastructure, or security threats. Once technology is employed to generate data but fails to do so, it may contribute to producing uncertainty, rather than certainty, by raising expectations that cannot be met. In addition,

some technological applications may also heighten epistemic uncertainty, through the fabrication and proliferation of mis- and disinformation, making it difficult to assess if online behavior is authentic (Keator and McNaboe, this article). In consequence, the struggle for reliable and certain information, through the debunking of “fake news” and rumors, has itself become part of peacebuilding efforts. Yet, as the authors demonstrate in the course of the forum, employing digital technologies to merely differentiate between what is the case (and what is not) often proves to be insufficient. Therefore, we should also explore how technology relates to uncertainty in ways other than establishing facts about the world.

The Ontological Dimension of Un-Certainty

While technology may generate more data and information about the world to help establish that something is the case, un-certainty is never solely the result of empirical inquiry or lack thereof. Indeed, for conflict parties, seeking certainty is often less an epistemic exercise than an existential one, which entails ascertaining their own identity and motives for conflict through the (re-)production of narratives and beliefs (Rumelili 2014a). Therefore, having certainty may emerge through means other than just the careful observation of the empirical world. Indeed, humans commonly act even if they do not clearly know the object they act upon and what will happen to it. At times, it may suffice to think that the approach is sound, while dealing with empirically complex situations that are difficult to decipher. This is because human conduct is commonly guided by views, convictions, and beliefs that shape what we think of what the world is composed. A degree of stability in this ontological dimension, achieved through a coherent system of beliefs, is necessary for any single belief of the world to be immune to doubt (Reed 2011).

Yet, when this system of beliefs is challenged, actors face ontological uncertainty. Unsurprisingly, seeking what has been described as “ontological security”³ is an objective not only for individuals, but also for states (Mitzen 2006) and, as we show, parties to intra-state conflict as well. We can thus think of ontological un-certainty as describing the degree to which conflict parties doubt their own beliefs related to the conflict. From a peacebuilding perspective, it may indeed be necessary to create ontological uncertainty rather than certainty, for instance, to challenge the parties’ narratives about the “Self” and the “Other” (Rumelili 2014b, 7). Third parties may employ technology primarily to work on the epistemological level—as is commonly the case in cease-fire monitoring, but the effectiveness of such efforts may be constrained by deep-seated ontological certainties that shape antagonism in the political arena (Sticher and Verjee, this article). Moreover, it is widely known that digital technologies, and especially social media, have the potential to perpetuate narratives that heighten political polarizations that rely on essentialist depictions of the enemy—but they are also employed in efforts to transcend them (Ashour 2011; Beaufort 2018). Indeed, social media produces new means through which the conflict parties can influence narratives about the conflict, themselves, third parties, and others, for instance, on social media (Keator and McNaboe, this article). This also comes with a potential for peacebuilding from the bottom-up that may help deconstruct hurtful ontological certainties (Kwaja, this article). However, the pervasiveness of algorithmic filtering systems means that conflict contexts (as all contexts) are today characterized by a multiplicity of ontological frames, which means that efforts to create a common narrative of the relationships between conflict parties are mediated by technology. While creating a mosaic of algorithmically

³ I equate ontological uncertainty and ontological insecurity because both have been described as the result of an unstable system of beliefs about the world. Yet, ontological (in)security tends to be more associated with long-term, historically evolved states (such as that of an individual person or a nation state), whereas ontological uncertainty is more often discussed in philosophically abstract terms. In international relations, uncertainty (about the actions of others) has been described as underpinning insecurity (see Mitzen 2006).

structured views on the conflict, technologies may also enable new forms of encounters between conflict parties, for instance, through online dialogues or virtual reality technology, which may create new ontological frames of reference (Kyelova and Hirblinger, this article). This means that the use of digital technologies in peacebuilding may both stabilize and destabilize existing ontological frames, thus coproducing un-certainty.

What is more, third parties who respond to conflict also often do so based on ontological certainty (and indeed require it), for instance, when they follow fixed protocols of engagement, based on established beliefs about what constitutes conflicts: conflict parties, weapons, interests, violence, and so on, as well as about their own identity, role, and mission. Technology can be instrumental in efforts to deal with uncertainty through operational approaches that enable peacebuilding actors to act with limited knowledge, such as system-theoretical and adaptive approaches that promise to cope with the fluid and relational nature of peace processes (De Coning 2016). Technology plays a role in producing ontological certainty by establishing new routines through which third parties respond to conflict. The routines provide an important orientation and supplement to epistemic certainty, for instance, to narrow the early warning—early response gap in peacekeeping missions (Duursma and Karlsrud, this article).

The Normative Dimension of Un-Certainty

Finally, claims that something *is* the case are commonly closely intertwined with commitments of how things *ought* to be, which create a moral perspective on the world (Jasanoff and Simmet 2017). Yet, agreeing on which particular norms or values should guide peace processes is not straightforward. Decisions and actions by stakeholders and conflict parties are commonly influenced by normative uncertainty, which can be described as the degree to which we are sure what is right to do, based on broader normative considerations (Lockhart 2000). Usually, norms guide the use of technology by defining what technologies are good to use, for example, through expert panels that define ethical standards for the use of AI-driven data analytics or through the everyday discourses of political leaders that make value claims. Such claims may also affect the legitimacy of data and evidence produced through new technologies, for instance, if the conflict parties endorse a monitoring body with having the epistemic authority to report on cease-fire violations. However, conflict-affected contexts are often characterized by the absence of a moral authority that regulates, sanctions, or legitimizes the use of technology. There commonly exists limited consensus about who or what has a legitimate knowledge-making authority, and conflict parties may engage in efforts to legitimize or delegitimize knowledge-making efforts, including the tools and methods used, and the outputs that they generate. Therefore, getting political support, for instance, for conducting an inquiry into war crimes or human rights violations, is often critical and the use of sensitive technologies such as early warning or remote sensing systems likewise requires the buy-in of conflict parties who can veto or obstruct their employment.

Moreover, third parties such as mediators may also face normative uncertainties when deploying new technologies. Particularly AI- and Big Data-driven applications have been called out for leading to “hard choices” as they promise innovative solutions while also coming with new risks, such as discriminating, biased, or in-transparent models. This commonly leads to conflicts in normative objectives, but also to uncertainty about whether intelligent systems can learn to operate according to norms (Dobbe, Krendl Gilbert, and Mintz 2021). In conflict-affected contexts, this is complicated by the fact that there usually exist conflicting moral assumptions

about what good peacebuilding entails. Peace-support efforts tend to be increasingly driven by norms, such as that peace processes should be inclusive (Hellmüller 2020), or principles such as that of civilian protection (Carpenter 2016). Yet, such norms and principles may be contested not only by the conflict parties, but also by third parties (Jütersonke et al. 2021). In such contexts, digital technologies may be employed as a vehicle to implement or enforce normative commitments and thus reduce normative uncertainty, for instance, when they are used to enhance digital inclusion (Hirblinger 2020), or the protection of civilians (POC) (Duursma and Karlsrud, this article). However, the employment of digital technologies, and particularly AI, may likely lead to conflicts between a utilitarian concern with efficiency and data quality on the one hand and a normative commitment to inclusion and participation on the other (Hirblinger 2022). Concerns with privacy (Wählisch, this article) or the safety of participants may similarly increase normative uncertainty about whether a certain technology ought to be used.

There are also more subtle ways in which norms and values may clash when technologies are employed. For instance, the production and use of data may be confounded by cultural and social attitudes toward technology and information that are rooted in local usage histories, such as a culture of suspicion due to authoritarian surveillance. While international actors may want to hold the conflict parties accountable for human rights violations using forensic methods, not all stakeholders may agree that establishing an account as precise as possible about atrocities is the best way of dealing with past grievances and trauma (Buckley-Zistel 2006). This suggests that overall, technology is shaped by, and shapes, normative un-certainty.

Entanglements of Un-Certainty and Technology

This introductory discussion suggests that the use of digital technologies in peace processes relates to un-certainty not only in its epistemic dimension, but that it also conditions—and is conditioned by—un-certainty in its ontological and normative dimensions. The individual sections that follow will move beyond this admittedly broad-brushed finding, to explore how the employment of digital technologies creates entanglements across these three dimensions, variably leading to mutual reinforcements or to trade-offs between them. For instance, the discussion of conflict analysis, forecasting, and predictive methodologies by Wählisch, McNaboe, and Keator points to the limited ability of data-driven approaches to reduce epistemic uncertainty, and the need to employ technologies in ways that provide sufficient ontological and normative certainty for decision-makers that aim to support conflict prevention or resolution. Karlsrud and Duursma demonstrate how this can, for instance, be done through technological devices that help not only with gathering and sharing data, but with institutionalizing normative standards and routines for action. However, epistemic uncertainties may also persist because of the actions of conflict parties and stakeholders—for instance, in spreading misinformation—and in such contexts, practitioners often struggle to differentiate what is real from what is merely virtual. Indeed, where the ontological and normative dimensions of conflict are insufficiently addressed, information- and knowledge-focused approaches, such as employed in cease-fire monitoring, may have limited impact. Looking at cease-fire monitoring, Verjee and Sticher demonstrate that if technology increases epistemic certainty about conflict party behavior, but this is not matched by corresponding actions from third parties, it can create normative uncertainty about what is acceptable behavior and what not. In contrast, the contributions by Kyselova, Hirblinger, and Kwaja demonstrate how broad-based and society-centered online dialogue and social media campaigning efforts may open opportunities to address the conflict on an ontological level, by tackling the deeply engrained beliefs, narratives, and identities of conflict parties and stakeholders. The individual contributions shed light on these interactions across the three dimensions in greater detail,

while highlighting implications for policy, practice, and research on digital technologies in peace processes.

The subsequent sections discuss the relationship between technology and uncertainty, each focusing on specifically relevant activities that have recently seen an uptake of technological innovation. These activities may be thought of in terms of a sequence, ranging from conflict forecasting and analysis to peacekeeping, dialogues, and long-term conflict transformation—but they also commonly take place in parallel or in an iterative fashion. Our order is mainly an aesthetic choice, providing a sequence of reflections that is intuitive, additive, and dialogical and thus brings value to the reader. Overall, the forum demonstrates that a greater awareness about technology's ambivalent relationship to un-certainty is merited. Research, policy, and practice can gain much from studying the interactions between the epistemic, ontological, and normative dimensions of this relationship. However, as Perera concludes, uncertainty is often a consequence of multiplicities, contradictions, and messiness that are not only inherent to conflict, but also a sign that there is always more than one view on the world, and more than one pathway toward peace—and that this, in the end, is a good thing. Rather than reducing uncertainties, peacebuilders may want to look into ways of productively engaging with them—and new or digital technologies almost certainly have a role to play in such efforts.

How to Tame Uncertainty for Peace: New Approaches to Predictive Analytics and Foresight

MARTIN WÄHLISCH

United Nations DPPA Innovation Cell

“War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty [...] A sensitive and discriminating judgment is called for; a skilled intelligence to scent out the truth,” noted the nineteenth-century general and military theorist [Carl von Clausewitz \(2007, 46\)](#). His observation is a reminder that uncertainty is present as both a strategy and a tactic in armed conflict. Likewise, uncertainty continues to permeate the imperfect war–peace continuum. Indeed, conflict prevention, peacemaking, and peacebuilding are all about managing uncertainty. Where will the next armed conflict arise? How can we reconcile differences to forge a peace deal? Will the peace agreement last? The future is an inescapable unknown. Nobody can predict what comes next. We can only forecast fragments of what lies ahead. In this endeavor, emerging technologies have increasingly become a compass. Machine learning can help unpacking patterns of past conflict dynamics. Artificial intelligence (AI) can support detecting divergent voices to prevent spoilers taking the stage. Geospatial analysis can assist in sensing water depletion, effects of transhumance, or security activities from space. We are just at the beginning of discovering the possibilities of new technologies for peace.

Accelerated by the Secretary-General's Strategy on New Technologies (2018), the Data Strategy of the Secretary-General (2020), and the wider reform agenda, the UN has been exploring new means to transform data into future insights and strengthen its conflict-prevention capacities. The Data Strategy highlighted that the overall aim is to bolster analytical strength to support evidence-based decisions with insight, impact, and integrity. As a response, the UN Department of Political and Peacebuilding Affairs (UN DPPA) established in 2020 a dedicated capacity to explore, pioneer, and leverage cutting-edge methodologies in support of its

mandate delivery, with the aim to leverage emerging technologies to strengthen the UN's early warning, mediation, and peacebuilding efforts. Awareness and capacities across the UN system to address futures more systematically are growing.

"I would use two words to describe the state of the world today: uncertainty and instability," stressed UN Secretary-General António Guterres at the World Economic Forum Annual Meeting in 2020 (WEF 2020). Using the Four Horsemen of the Apocalypse as a reference, he described what he called four "huge challenges" to the world today: climate change, mistrust of leaders, increased geopolitical tension, and the dark side of the technological revolution. In January 2022, Guterres added in his remarks to the General Assembly on his Priorities for 2022: "The only certainty is more uncertainty ... Now is not the time to simply list and lament challenges. Now is the time to act ... We face the highest number of violent conflicts since 1945" (UN 2022). He renewed his call for bold reforms to make progress on more effectively delivering sustainable peace.

This part of the forum article focuses on new approaches to predictive analytics and foresight. Written from the UN practitioner perspective, it draws from the experience of the UN DPPA Innovation Cell. I argue that the application of emerging technologies needs to be complemented with foresight methodologies and futures thinking to address uncertainty related to early warning, dialogue processes, and peace consolidation.

Chasing the Present: New Data-Driven Approaches

At the UN DPPA, we look at new technologies, peace, and uncertainty from two sides, namely with regard to integrating new technologies to enhance our work, while also trying to better understand and manage new risks posed by technological advancements. New pressures from digital technologies, the virality of hate speech, and disinformation have further complicated the conflict landscape by introducing new forms of epistemic uncertainty.

Gaining epistemic certainty requires differentiating between data that represent real behavior and events and data that are fabricated. Therefore, we have focused on unpacking signals on social media to advance situational awareness by monitoring ongoing developments and social mobilization but also to get a grip on misinformation campaigns and coordinated inauthentic behavior. To this end, the DPPA Innovation Cell introduced and rolled out the social media reporting tool Sparrow to expand social listening capabilities across the UN Peace and Security Pillar. Other open-source applications and social media analytics recipes help us to conduct more complex network analytics to assess shifting political factions and followers with the overall aim to foster early warning and live monitoring of unfolding crisis situations. Take the example of sudden migration movements that can be monitored through near-to-real-time anonymized communication data to faster and more systematically detect brewing social tensions. We are also investing into advanced analytics, including speech-to-text analysis, text mining, and machine vision. All those investments in advanced analytics aim to lower uncertainty regarding political, social, and security factors that impact peace processes.

We also aim to collect a larger and more heterogeneous amount of data to obtain new information about conflict contexts. Early warning systems often aim to reduce epistemic uncertainties but struggle to fully do so. In consequence, it is often difficult to assign probabilities to the likelihood of particular events occurring. For example, in negotiations about water conflicts, it might be insufficient to predict next year's rainfall by just relying on historical records. This is where new technologies such as open-source earth observations can provide additional data points. At the UN DPPA, we are piloting and scaling open-source earth observation-based approaches using new satellite technology, to enable the data-driven and computer-enabled prediction. We are also exploring interdisciplinary approaches, such as

remote sensing and machine learning, to develop more sophisticated early warning systems. Machine learning bears the advance of pattern detection at scale. Remote sensing, such as geospatial analysis, allows for the monitoring of inaccessible locations where traditional ways of tapping into human-based information networks for early warning have limited reach, and may carry inconsistencies or analytical bias. For instance, we are currently advancing applications of satellite imagery analysis for early warning of water-security-related unrest based on modeling-estimated future trends of conflict risk indicators. This is a case where a combination of geospatial analysis, conflict modeling, and machine-assisted analytics addresses uncertainty of real-world conflict causes by providing us insights into statistical correlations. These new technologies enable new levels of epistemic certainty because human-based geospatial analysis of the same caliber would take decades to be completed while new technology leverages pattern detection at light speed.

More and better data can also be produced by using digital technologies in ways that broaden participation and the inclusivity of peace processes. This not only helps obtain more information, but also makes the outcomes of peace processes more durable by incorporating conflicting public views. However, involving more conflict-affected populations, such as through online surveys, produces large amounts of data that are difficult to analyze with human capacities alone (Hirblinger 2020). As part of our innovation work, we have invested into machine learning applications that help with Natural Language Processing (NLP) to expand inclusivity in peace processes. In 2020, DPPA, together with the Office of the Special Envoy for Yemen, launched the first-ever AI-assisted, large-scale virtual consultations with Yemeni citizens on the opportunities and challenges of the ongoing peace process. Similarly, we helped generate timely insights through AI dialogues that supported the United Nations Support Mission in Libya (UNSMIL) in advancing the Libyan political process at the end of 2020 and in early 2021. However, machine-supported text analysis faces practical challenges if employed across the diversity of language contexts in which the UN operates. In partnership with an academic consortium of NLP experts, we therefore continue to advance language resources and tools for conflict-relevant local dialects, to create more epistemic certainty about people's needs and interests.

Inclusive approaches will also bring the competing ideological, social, or political narratives and beliefs to the fore that make conflict resolution so difficult. A divergence in these ontological frames can create uncertainty because we often just recognize what we expect or want to see—which creates blind spots or views on the world that can be difficult to reconcile. This is a challenge likewise for conflict parties and third-party mediators or peacebuilders. In this context, data-driven sentiment analysis combined with topic modeling can help analyze rhetoric of conflict parties while disentangling political positions. It can allow deciphering public voices at large, widening views of analysts and peacemakers to gain a better sense of how ontological and epistemological dimensions shape conflict dynamics.

Chasing the Future: Challenges of Anticipation

The picture becomes more difficult if we aim to use new technologies to anticipate or predict future events. In peace processes, it can be a powerful realization to comprehend that we cannot predict the future, but we can be prepared for it and minimize surprise. Neither conflict parties nor peace mediators can fully predict the success of presumed causal relationships between peace interventions and greater stability. For instance, peace negotiation partners may not foresee how policy choices such as resource distribution, power-sharing, or security arrangements will deliver peace dividends. We cannot arrive at “the future” as there are constantly multiple futures ahead of us. The future is not something that happens to us, but something that we make happen. Therefore, we strive toward anticipatory decision-making,

combining new technologies with foresight methodology—a “thinking technique” that “tells stories about possible futures based on critical uncertainties” (United Nations 2021a) and thus that helps to steer a course between the unsettling uncertainty and unpredictability against imperfect data, information, and intelligence.

Foresight studies reassure us that we need to get more comfortable with uncertainties as they are an inevitable part of social and political processes. Foresight exercises can be data-rich and enabled by technologies (Boysen 2020). For instance, we often draw from comparative country-specific and regional data sets for diagnostic baseline studies that inform foresight exercises. Tech-enabled Social Network Analysis for complexity analysis or Cross Impact Systems and Matrices (Système et Matrice d’Impacts Croisés, SMIC) to evaluate changes in probability are also common instruments in foresight exercises. However, instead of trying to perfect forecasting efforts with better data to achieve the highest possible precision, it is rather important to identify different plausible future scenarios, explore what impacts they could have, and identify potential implications for policies. For instance, computer-assisted simulations can assist in thinking through more complex eventualities and projected trajectories of political, economic, humanitarian, and other factors. Against this background, emerging technologies can support decision-making processes while addressing and sensitizing for persisting uncertainties. However, we carefully take into consideration constraints and limitations when employing digital technologies while avoiding wishful thinking and prophecies.

In practice, foresight is an opportunity to hunt for wicked problems in complex systems (Song 2021). Over the last 2 years, we launched a series of pilots exploring foresight and futures thinking. For instance, together with some UN Country Teams, we focused on future-proofing planning assumptions to solidify the foundation of strategic cooperation both within the UN family and with governments. This has been particularly critical following the shock of the COVID-19 pandemic, which challenged linear thinking about program deliveries and sensitized the UN system to be mindful of unexpected disruptions. Another example is our collaboration with United Nations Educational, Scientific and Cultural Organization (UNESCO) on futures literacy in support of peacebuilders from Northeast Asia empowering youth to imagine futures free from past historical legacies (Song 2021).

Chasing Peace: The Limits of Technology

Humans tend to have an obsessive relationship with technology. Lucy Suchman, a pioneer in the field of human–computer interaction, has continuously raised concerns about tech fetishism and a blind reliance on technology without remembering its limits (Waehlich 2021). Humanity also seems fascinated with prediction but does very poorly with it (Silver 2012). Technology cannot grant certainty but multiply our chances of taming the cunning of uncertainty (Nowotny 2016). Eventually, we need to embrace uncertainty in peace processes as there is no way around it but through it. Technology may enable new forms of epistemic certainty and provide methods that support decision-making and action. However, uncertainty remains with us, for instance, if we are presented with machine-generated probability or reliability scores.

The COVID-19 pandemic has reminded us of the insufficiencies of prediction efforts against the background of irrational policy choices and fluid variables that define global stability. If these challenges are to be overcome, machine-assisted prediction and human-led foresight needs to be joined in tackling uncertainty. This means to use technology wisely to make better decisions, trusting the possibilities of emerging tech but also being vigilant to its overfitting. New technologies can be a game-changer, but they will not change the rules of the game of war and peace that are made by humans, including its horrors and dilemmas.

the *Carter Center's Syria Conflict Mapping Project*.⁴ Yet, we show that the complex and fluid networks of armed groups on social media platforms and the copious amount of open-source data heightened the epistemic and ontological uncertainty of mediators, which resulted in missed opportunities to mitigate or resolve the conflict.

Social Media as a Shaper of Conflict

Social media can overcome traditional barriers to collective action by lowering the economic cost of participating in conflicts, lowering opportunity costs, and increasing the perceptions of victory (Linebarger 2016; Brown 2017). Therefore, it is no surprise that savvy individuals attempted to shape the Syrian conflict by demonstrating their power and influence on the virtual battlefield. Many armed groups increased their social media presence to seek funding and new recruits. As the conflict began to unfold online via chatrooms, Facebook, YouTube, and Twitter, armed groups used these platforms to build public presence. Between April 2011 and December 2013, The Carter Center documented and analyzed 2,529 videos posted on YouTube by armed groups. We noted that several names consistently appeared, including Sheikh Hajjaj al-Ajmi and Hamid al-Hajari—individuals or organizations known for providing support to armed groups (The Carter Center 2012; Dickinson 2013, 14). After new groups formed, many thanked their funders in YouTube videos, which they shared on their social media accounts. For instance, the armed group Katibat al-Farouq clearly understood the power of an online network of funders, as the Twitter accounts it followed in early 2012 showed (almost exclusively) connections to a list of wealthy Saudi and Islamists with expressed intentions to fund the Syrian conflict (figure 1) (The Carter Center 2012). Over time, the social media presence of such groups improved with flashier graphics and more coordinated postings.

As others have since noted, the prevalence of international financing options in civil wars has contributed to the fragmentation of armed group networks (Gallagher Cunningham 2016, 5). The dynamics between armed groups and influential wealthy individuals on online platforms also translated to real-world actions. As donor fatigue set in at the end of 2012, public fundraising took on a sectarian tone. The effects of this divisive rhetoric were witnessed during a 2013 offensive by armed opposition groups to take Alawite villages in Latakia Governorate, resulting in the massacre of 190 civilians (Human Rights Watch 2013, 2). Kuwaiti individuals fundraised heavily for this offensive on social media, using derogatory terms such as “Safavid” to describe Shias, although they did not explicitly call for a massacre (Dickinson 2013, 16–17). Competition among funders fueled the frenzied formation and disintegration of armed groups throughout 2012 and early 2013, and many armed groups were willed into existence through savvy social media campaigns and religious rhetoric.

Observation of Social Media Data in Syria: Opportunities, Risks, and Lessons Learned

That armed actors used social media platforms to promote their cause, raise funds, and communicate with each other did not remain unnoticed. Their online activities were largely visible to conflict responders, but few knew what to make of the information posted online, which points to a range of epistemic and ontological uncertainties that this kind of social media analysis created. Could it be trusted? Was it representative? And how does one go about making sense of it? Ultimately, do these data provide actionable information, or a picture too complex to be useful? For instance, does the mere fact that an armed group has announced

⁴https://www.cartercenter.org/peace/conflict_resolution/syria-conflict-resolution.html.

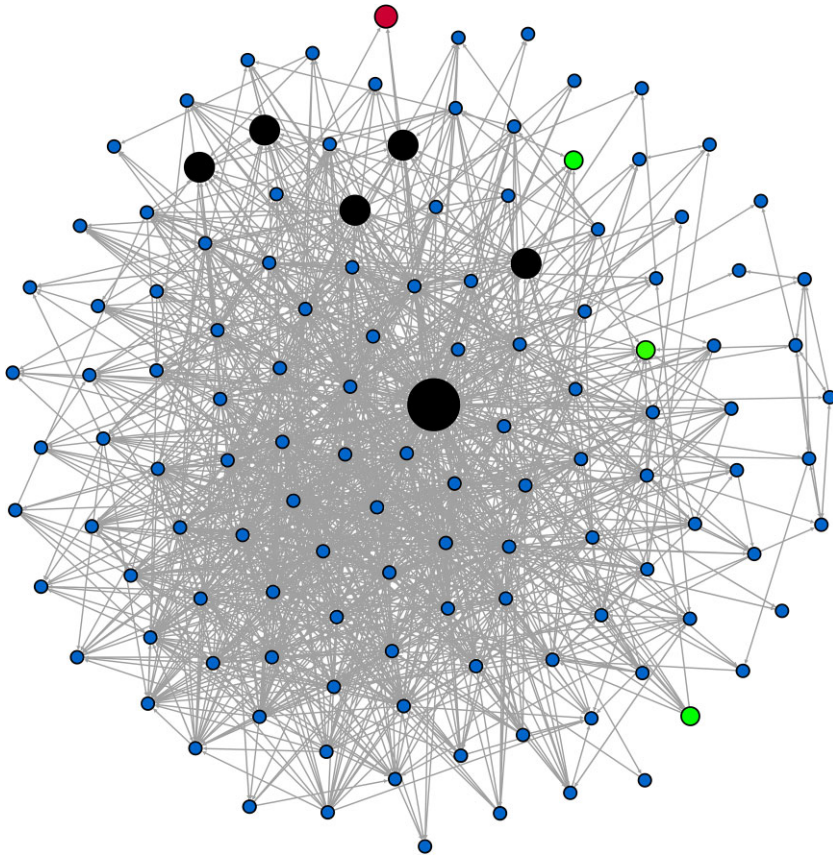


Figure 1. The Twitter network of users followed by Katibat al-Farouq, or the “Farouq Battalion,” from early 2012. Blue nodes represent wealthy Saudi or Kuwaiti Islamists with an expressed interest in funding the armed opposition in Syria. Green nodes are popular international public figures, black nodes are pro-opposition Syrian news sites, and the red node is the Ministry of the Interior of Qatar.

themselves online mean that international actors and conflict responders should meet with them? This epistemic uncertainty about which aspects of social media represent offline reality often impeded the proactive engagement of international actors with armed groups. In the following, we explore the challenges of making sense of armed groups’ use of social media by looking at a small portion of the available information: armed group formation announcements in Syria from 2011 through the end of 2013.

Over the course of the conflict, there have been many more hours of video of the conflict than there have been hours of actual violence, not to mention the countless tweets and Facebook posts, leaving mediators wondering if it was even possible to know what was happening in Syria via a social media content analysis. The 2,529 videos of armed group formations, mergers, and disintegrations that the Carter Center’s mapping and analysis unit collected were gathered to create epistemic certainty for both its conflict-resolution team and others focused on peace mediation, that is, clarity about the basic constituents—in terms of armed actors—of the Syrian conflict. Mediators and diplomats had little to no reliable information regarding the chaotic development of armed groups throughout Syria that could be sourced without technology. Many of the groups they met with would claim to be much more important than they really were. In early 2013, the Center spoke to an armed group

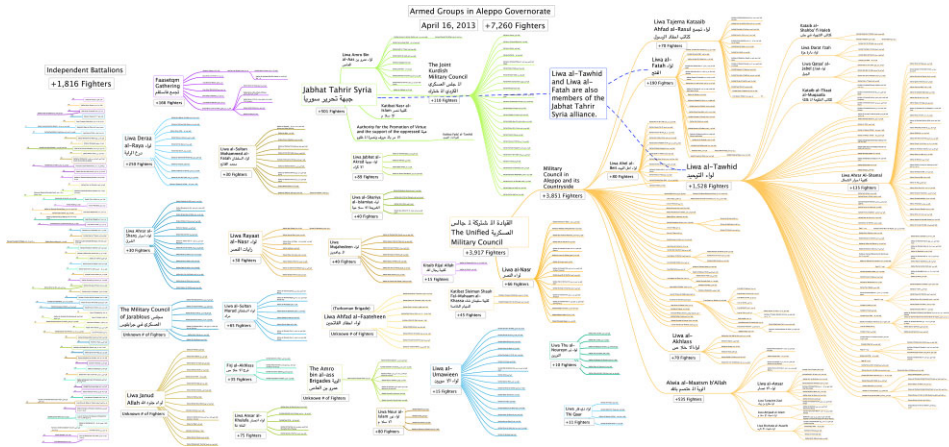


Figure 2. A visualization showing all known armed groups that had formed in Aleppo governorate as of April 16, 2013.

Sourced: The Carter Center's Syria Conflict Mapping Project.

commander in close contact with international diplomats, who claimed to represent 70 percent of the country's armed groups. However, our data contradicted his claim, as no single group or network represented more than 30 percent of the declared groups throughout the country. The pictures generated with and without technology did not match up—leaving two competing claims generated through two different methods—and thus heightened our sense of uncertainty, rather than certainty.

Overall, while the detailed mapping of armed groups was intended to create more certainty about the Syrian conflict, it often had the opposite effect. The Carter Center shared its analysis with mediators throughout 2012 and published its mapping data online in 2013 (figure 2) (McNaboe 2013). Despite the publication of this information and close working relationships with the UN mediation team and diplomats, political and practical difficulties prevented many engagements based on these data. Mediators and international diplomats repeatedly expressed shock at the sheer number of actors and the complicated relations between them. The complexity of the picture created more ontological uncertainty about their approach of engaging with these parties. For instance, would meeting with too many actors encourage further fragmentation? Would meeting with a particular faction provide it with legitimacy that can negatively shift the dynamics of the conflict?

Mediators and diplomats also often lacked the capacity to deal with the complex picture that our map had produced, leading to repeated surprises about developments that should have been predictable. One such event was the formation of the Islamic Alliance in late 2013. The alliance explicitly rejected the main internationally recognized political leadership of the Syrian opposition and its associated military leadership, effectively rendering the body powerless immediately prior to the second round of negotiations in Geneva. Prior to its announcement, multiple signs indicated that the armed opposition was moving in a different direction than the Turkey-based political opposition that was then engaged with international interlocutors. The biggest indication came nearly a year before, when a collection of some of the largest groups throughout Syria announced that they would form a single coalition, with the intention of sharing resources and coordinating efforts. This coalition, known as the Syrian Islamic Liberation Front (SILF), stated that it was separate from their “brothers” in the Free Syrian Army, and criticized the Turkey-based leadership. Shortly after its formation, another coalition, known as the Syrian

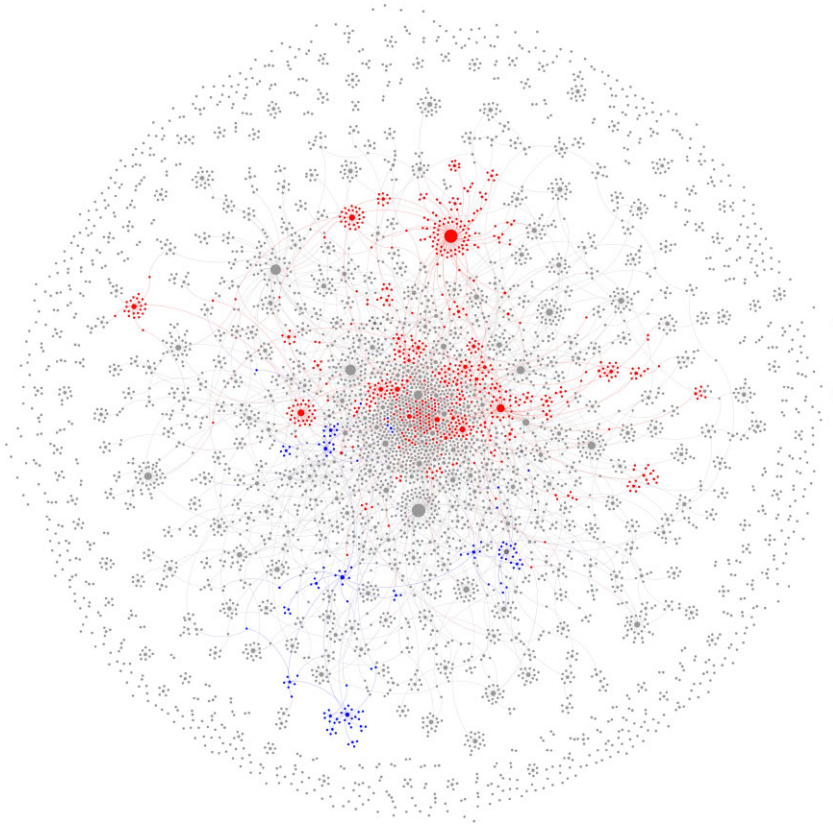


Figure 3. All groups recorded by the Carter Center as of early December 2013. Each node represents an announced unit of fighters. Lines between nodes represent hierarchical relationships. Nodes are sized according to their importance in the overall network. The Syrian Islamic Liberation Front is colored red, while the Syrian Islamic Front is colored blue.

Islamic Front (SIF), announced its formation in December 2012, expressed an explicitly religious agenda, and included many of the remaining independent units.

Over the course of the following year, our mapping project documented that the network of units associated with the SILF, and the SIF, had grown steadily and had increasingly asserted themselves as powers to be reckoned with (figure 3). The trend in network growth independent of the formal leadership of the FSA far outpaced the growth of FSA networks and showed a clear trajectory toward fragmentation. By the time SILF and SIF groups announced the Islamic Alliance and expressed their rejection of the formal FSA leadership, their announcement was more an affirmation of reality than breaking news. In the lead-up to the announcement, there was ample evidence that the political leadership of the Syrian opposition was losing its role as a leader of the movement. The leaders of these new movements had made no secret about their independence, and thousands of fighters had flocked to their cause. Yet, at the time, the copious amounts of data did not provide that clarity. There were thousands of videos of different armed groups being uploaded, nearly all groups appeared under the same revolutionary banner, none appeared to be fighting each other, and few of the breakaway factions had international representatives engaging in “face time” with the diplomatic community. Even for those watching social media for video statements and formations, it was difficult to see the forest for the trees.

More fundamentally, mediators and diplomats did not view social media as a valid source to gain clarity about the conflict dynamics in Syria, largely because they did not know whether or how social media reflected reality on the ground. In other words, social media analysis did not provide them with the epistemic certainty necessary to make reliable claims about the conflict. Even as the novelty of social media's presence as a fundamental ingredient of modern conflict became an accepted norm, uncertainty remained a persistent and pernicious obstacle due to an overabundance of data and competing narratives coming from online sources, the traditionally relied-upon offline experts and analysts, and the (often self-aggrandizing) claims of conflict participants themselves. The addition of large amounts of data made the attainment of clarity even more difficult.

New Partnerships Are Needed

Mediators and responders to today's conflicts must work to embrace online data in their efforts to make sense of armed conflicts, because online interactions are a fundamental force shaping modern conflict. However, when dealing with such data, practitioners must also embrace complexity and fluidity and the epistemic uncertainty that comes with it. The ever-growing amount of data available and the increasing prevalence of unstructured video content mean that analysts will always be playing catch-up to content generation. Policy research on social media has consistently focused around shifting engagement with social media, such as recognizing the role of key influencers and encouraging governments to form stronger partnerships with social media companies to respond to hate speech and other potential flashpoints (Brooks, Ferroggiaro, and Lichtenheld 2021). Yet additionally, misinformation, disinformation, self-censorship, content removal, and privacy laws affect how accurately the online world reflects reality. When engaging with online content, the community of conflict responders will have to share experiences, discuss methods, and collaborate with a diverse array of partners in academia and the public and private sectors—in particular, social media companies themselves—to ensure that engaging with such data creates more certainty than uncertainty.

Narrowing the Warning–Response Gap: Technology, Coordination, and the Protection of Civilians in UN Peace Operations

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Protection of civilians (POC) has been a core mandate for UN peace operations since the failures in Bosnia and Rwanda in the early 1990s. However, despite great efforts to clarify how UN peace operations can implement the POC norm, there has been very little attention to how early warning enables peacekeepers to anticipate POC-related threats. Even less attention has been given to how coordination among different UN peacekeeping staff ensures an adequate response once an early warning has been issued, and how a lack of coordination hinders a response. This is a striking gap in research since early warning is only effective if it also leads to early action. As Edward Luck, the former Special Adviser to former Secretary-General Ban Ki Moon, puts it: “Early warning without early and effective action would only serve to reinforce stereotypes of UN fecklessness, of its penchant for words over

deeds” (UN General Assembly 2010, 3). We therefore reflect not only on how the UN has steadily improved its capacity to identify and anticipate threats to civilians, but also on initiatives to improve coordination—with the use of technology.

We first discuss the concept of the early response gap put forward by [George and Holl \(1997\)](#). We demonstrate that un-certainty is central to early warning—estimating the likelihood of rare events such as intercommunal violence is difficult, also when assisted by technological tools. The second part links the theoretical discussion of the warning–response gap to POC-related efforts within tech-enabled UN peace operations, with a particular focus on Mali. Engaging with the framework suggested by Hirblinger in this article, we find that technology not only improves the epistemic certainty of early warning through better evidence. It can also help translating early warning into early action through standardization, hence increasing normative certainty about the *right* response at a given point in time, and increasing ontological certainty by suggesting a clear path of action. We also highlight that field operations may be better placed to overcome the early action–response gap as there is considerable technological innovation and field operations may be less encumbered by headquarters’ political decision-making. However, we also reflect on how the increasing use of digital technologies to streamline early warning and early action can create new blind spots.

The Warning–Response Gap

Many studies have looked at what explains effective early warning ([Zenko and Friedman 2011](#); [Duursma 2017](#); [Duursma and Karlsrud 2019](#)). Less research exists on how early warning is translated into early action. This is problematic because while it is clear that early warning is possible, it is not always heeded. Indeed, according to the concept of warning–response gap by [George and Holl \(1997\)](#), prior research focused too heavily on the accuracy and timeliness of early warning, ignoring the problem of having policymakers to act on the information. A response is not necessarily forthcoming when an accurate early warning is issued. Even earlier, [Betts \(1980\)](#) demonstrated that administrative workloads and cognitive biases, rather than a lack of early warning, explain failures to prevent crises. Evaluating the inability of the UN to stop the genocide in Rwanda, [Eriksson et al. \(1996, 62\)](#) pointed to both structural and cultural reasons for why critical information was not provided to the UN Security Council. Structurally, there was no central unit at the UN Secretariat “charged with collecting even ‘soft’ intelligence”; culturally, “DPKO only proposed ‘what the traffic would bear’” ([Eriksson et al. 1996, 67](#)) (their words), not what the analysis dictated (see also [Barnett and Finnemore 2004](#)).

Existing research suggests that technology may have an ambivalent relationship to early action. For instance, looking into how early warning about impending civil war and preventive policy interact, [Meyer et al. \(2010\)](#) argue that technological innovation is likely to only widen the warning–response gap because more and more accurate early warnings—as a result of technological innovation—are unlikely to be acted upon. Even if attacks on civilians are accurately anticipated within UN peace operations, organizational and political constraints will still likely hamper an effective response. Indeed, they argue that decision-making—not technical improvements to early warning systems—is the greatest determining factor of early action ([Meyer et al. 2010, 557](#)). These can, for instance, relate to member states’ unwillingness to send troops into harms’ way, or the UN being unwilling to send civilian peacekeepers to facilitate intercommunity dialogue in a high-risk setting.

We suggest thinking of the early warning–response gap as a disconnect between efforts to establish epistemic certainty, on the one hand, and ontological and normative certainty, on the other. The role of epistemic uncertainty in enabling early action has recently gained more attention. For example, [Duursma \(2018\)](#) shows how information about security situations is often insufficient, because peacekeeping

staff need to understand the operational context to make sense of the information they gather. As we demonstrate, technological innovation can go beyond improving epistemic certainty through early warning data, to strengthening the ontological and normative certainty necessary for early action and thus making it more likely. In the next section, we discuss the UN's efforts of creating a "back to front" early warning system in which warnings are linked to actual response initiatives. We focus on the implementation of a new mobile app developed by the UN Operations and Crisis Centre (UNOCC) for the UN mission in Mali, with the potential to enhance coordination, improve decision-making, and establish routines to facilitate early action.

UN Early Warning and Rapid Responses

Over the past two decades, UN peace operations have steadily been improving their organizational capacity to build epistemic certainty and identify and anticipate threats to civilians. Peace operations typically have numerous different sections and units that collect information on POC-related threat, such as the Human Rights section that can quickly issue emergency reports to the mission leadership (United Nations 2001, 14). The Civil Affairs section gathers information about perceptions and concerns of different groups with regard to POC (UNDPKO 2012, 131) and the Force component of UN peace operations has an intelligence unit that collects POC-related information (Dorn 2010).

Since UN missions have different sections working on POC-related issues, epistemic certainty at the organizational level is much needed. The Department of Peace Operations took a major step in this regard in 2005–2006 by developing structures for information-gathering and analysis: it created the Joint Mission Analysis Centre (JMAC). JMACs are mandated to act as a strategic planning body, mainly to support senior management to analyze the security landscape and the political context. To this purpose, JMACs conduct all-source intelligence gathering using military, police, and civilian personnel (Duursma 2017). The JMAC coordinates with the Joint Operation Center (JOC) to map incidents and produce a timeline of key events, with the Civil Affairs section to analyze the conflict drivers, with the Human Rights section to determine the actual impact of an event or threat, and with Civil Affairs, Political Affairs, and Disarmament Demobilization and Reintegration (DDR) to jointly discuss any dynamics that can positively or negatively influence a situation. The integrated risk assessment led by JMAC thus leverages the diverse insights and expertise of different units across the peace operation. The final product is then intended to guide a cross-mission response (O'Bryan, Rendtorff-Smith, and Donati 2017, 48).

Despite the positive steps taken in terms of coordinating POC responses and strengthening the capacity for epistemic certainty, translating early warning into early action remains challenging for UN peace operations. An internal audit report by the UN found that information on impending attacks on civilians is key to POC responses. Yet, it also shows that even with information, a response is sometimes lacking due to the political and organizational constraints already alluded to (Office of Internal Oversight Services 2018, 29).

The UN therefore continues to improve its early action capacity in the field. For instance, the UN Security Council tasked the UN mission in Mali (MINUSMA) in 2020 to strengthen early warning mechanisms and systematically record and analyze MINUSMA's rate of response (UN Security Council 2020, 9). Consequently, MINUSMA adopted its new standard operating procedures for early warning and rapid response in June 2020 and implemented a new tool for the coordination of POC-related responses, called the *Early Warning Tracking Form*. The tool can be seen as an effort to increase normative and ontological certainty on early response and is supposed to guide efforts to improve rapid response to POC-related threats, by prescribing an adequate Mission response—including dialogue and

engagement, physical protection, and reinforcing the overall protective environment—to plausible, possible, and impending physical threats to civilians. This involves two mechanisms enabling a mission-wide response and mission-wide monitoring: (1) a rapid verification and dissemination of early warning information and (2) a monitoring mechanism for rapid response, which requires each of the relevant components of a peace operation to record the actions they have taken after an early warning has been issued (UN Secretary-General 2020; Smith 2021). The tool was first tested in the Mopti region in August 2020 and was rolled out to the other regions in September 2020.

Following the introduction of the *Form*, the UNOCC began to develop a full mobile application with automated emails and task assignments, thus further routinizing early response action. The app was not developed to receive the early warning itself, but rather to facilitate a rapid, coordinated, and multicomponent response to early warnings received by MINUSMA. The developer at the UNOCC describes the app as follows:

“Upon receipt of an early warning, this system will be triggered to send emails asking for responses from the Force, UN Police (UNPOL), UN Department of Safety and Security (UNDSS), and civilian components to the given early warning. Each of these components will enter their response in a central mobile/web app, with continuous email alerts to all others updating them on responses as they are received. At any time, they can all log in to see all components’ responses via a mobile app. This ensures a coordinated response, with all mission stakeholders receiving immediate notifications and having full visibility on all mitigative actions taken by any one of them.” (Email correspondence, February 9, 2021)

This mobile app was released by the UNOCC in late 2020, together with JOC and POC staff based in Mopti and implemented in all regional offices in MINUSMA in early 2021. The mobile app is seen as a huge improvement within the mission. Prior to the implementation of the *Early Warning Tracking Form* and the mobile app, MINUSMA staff used a WhatsApp group to coordinate responses, and this meant that it was often unclear whether action had already been undertaken. As one UN official notes: “Sometimes we’d have to call people and wake them in the middle of the night because there was no shared record” (Smith 2021, 18). The chief JMAC within MINUSMA further notes that the new mobile app makes a big difference by helping to “optimize the process and bring accountability and traceability” among the peacekeeping staff (email correspondence with MINUSMA Chief JMAC, June 22, 2021)—thus creating clarity about what has been done and what still needs to be done. Indeed, the early warning data of the app are linked to real-time data analytics tools that are used to identify key trends in early warnings as well as analyze the mission’s responses to early warnings (email correspondence with the UNOCC developer of the app, June 22, 2021). This illustrates how digital technology can contribute to implementing new standard operating procedures. From the perspective of the research by Allison and Zelikow (1999) on organizational processes, one could argue that the *Early Warning Tracking Form* and the mobile app essentially help UN peacekeeping staff to follow set repertoires and procedures when taking actions based on early warnings. These guide staff to possible mitigative actions, first providing epistemic certainty on the situation that is under development and then ontological and normative certainty on relevant actions.

However, as highlighted by Allison and Zelikow (1999), organizational processes can also be constraining. Indeed, there is a risk in limiting the range of possible actions, as the app also can establish routine behaviors and exclude other actions

that could have been taken. The app is mainly aimed at linking early warnings to adequate responses, which means that events and developments indicating a POC-related threat that needs a POC response are used as input. However, the social and political context in which a threat to civilians materializes greatly determines what type of POC response is most adequate in a given situation (Duursma 2018). This means that it is crucial that peacekeeping staff responsible for POC continue to critically reflect on what type of action is most likely to mitigate a POC-related threat based on a given context, to avoid new blind spots being created. In other words, the app should be used as an additional tool for coordination, but it can never replace the need for contextual understanding.

Consider the Interplay of Uncertainties in Early Warning

While much has been written about the warning–response gap, little attention has been given to how technological advances can help establish epistemic certainty and close this gap. Our contribution reflects on current efforts within UN peace operations to narrow this gap. The creation of the JMAC and implementation of various tools within missions have contributed to establishing epistemic certainty at the field level of the organization that aims to link the identification of POC-related threats to an adequate response. A particularly promising new tool is the *Early Warning Tracking Form* within the UN mission in Mali. Its implementation and the use of the mobile app show how technology not necessarily widens the warning–response gap. It can also help narrowing it. The technology improves the capacity at the local level to strengthen epistemic, ontological, and normative certainty, and increases the chance that early warning may be translated into effective early action. However, technological solutions are no panacea as their effectiveness is always context-dependent. In our case, the technology was harnessed to improve processes within organizational structures, yet things get more complicated when conflict parties or stakeholders have to play an active role in the peace effort. This aspect will be further explored by Sticher and Verjee’s discussion of cease-fire monitoring in the next section, which demonstrates that political dynamics and the behavior of conflict parties mediate the link between technology use and un-certainty in peace processes.

Addressing Uncertainty through Cease-Fire Monitoring: Can Technology Lift the Fog of War?

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Addressing uncertainties in armed conflicts is a core function of cease-fire monitoring. By collecting, verifying, and sharing information around cease-fire compliance, monitoring missions primarily address epistemic uncertainties. They also often confront ontological un-certainties, shaping conflict parties’ views about each other’s intentions (Hirblinger, this article) and seeking to produce ontological security about the consequences of cease-fire violations. In our contribution, we argue that the use of new technologies by cease-fire monitoring missions strengthens their epistemic abilities, but their ability to work at the ontological level is primarily shaped by politics, which defines missions’ mandates and implies rules about

third-party engagement in conflict management situations. To build our argument, we first assess the relationship between monitoring missions and different types of uncertainties, before considering the effects of new technologies on the basis of the cease-fire monitoring case where technology was used most extensively: the OSCE mission in Ukraine, which until the Russian invasion was considered a model to emulate in other cease-fire monitoring contexts. We then discuss the implications for cease-fire monitoring more broadly.

Cease-Fire Monitoring and Uncertainties in Armed Conflicts

Fortna (2003, 2004) describes three key strategies to help conflict parties create more durable cease-fires. The first is to alter parties' incentives to commit cease-fire violations. This primarily involves measures to ensure that violations are costly, and therefore are unattractive for parties to use as a means of gaining a military advantage. The second mechanism is to reduce uncertainty about intent and actions. Conflict parties often face uncertainty about *what* happened, and what this tells them about the *intent* of their opponent. In contexts characterized by high levels of mistrust, parties may often assume that the opponent acts in bad faith, which likely undermines genuine efforts to institute or sustain a cease-fire. One way for conflict parties to signal their intent to comply with a cease-fire is by accepting measures that make noncompliance more obvious and more costly, such as cease-fire monitoring mechanisms. Monitoring missions may also shape perceptions about the intent of an opponent by helping actors distinguish between aggression, legitimate actions, and accidents. The third mechanism is to control accidents from spilling out of control: cease-fire violations may often not be deliberate and strategic, and instead be accidents, misunderstandings, or spoiling behavior from forces on the ground. Mechanisms to deal with such situations can mitigate the risks of involuntary escalation in a context of deep-seated mistrust between the conflict parties.

All three of these mechanisms relate directly or indirectly to un-certainties in peace processes. For the first mechanism, *altering incentives*, third parties need a high level of epistemic certainty about who committed a violation and under what circumstances, if they are to consider responses that impose costs on the violating party. Monitoring missions can help to create such certainty, using a range of technologies to gather, verify, and share credible information about the specific circumstances and about culpability. Yet, reduced uncertainties may not translate to higher costs for a cease-fire violation if politics curtails the ability of third-party actors to act upon monitors' information. The wider use of technology in cease-fire monitoring does not necessarily overcome such politics and may create normative uncertainty about the consequences of cease-fire violations, which reduces the ability of third-party actors to effectively shape future behavior.

The second and third mechanisms—*reducing uncertainty about intent* and *controlling accidents*—relate to epistemic and ontological un-certainties at the level of the conflict parties. Third parties may be able to provide information at the epistemic level, but the effectiveness of such information is conditioned by the political authority and legitimacy of a mission and its ability to provide a contextualized understanding of conflict events. In many civil conflicts, where conflict parties live in the same territory and were often even formerly aligned, third-party monitors may understand the context, history, capability, and resolve of the conflict parties much less than the belligerents themselves, severely limiting monitors' ability to provide effective information or to influence the perceptions of conflict parties. Technology, in particular the use of remote sensors, can help gather information that facilitates the interpretation of incidents and that may be shared with conflict parties as documentary evidence of a violation. The use of technology may therefore help a monitoring mission to (re-)establish some epistemic authority, if it allows monitors to gather and verify information through means that are not accessible to the parties themselves.

However, uncertainties about intent and escalatory dynamics may often not be due to uncertainty about *what* happened, but just as much, result from competing narratives and beliefs shaping perceptions of an opponent's intent and justification. Moreover, the line between different types of actions is often blurry and shaped not only by explicit rules but also by norms about appropriate behavior during a cease-fire. Monitoring missions commonly aim to increase such normative certainty by setting normative standards, such as by continually assessing the aspects of actors' behavior they choose to investigate and highlight in their reporting. If they involve conflict parties in their monitoring practice, third-party monitors can also provide a "ritualized space" in which disagreements can be resolved (see Fortna 2003, 343–45; Brickhill 2018). Technologies, such as exchanges via videoconferencing, or joint discussions of evidence gathered through technological means, can co-create or complement such ritualized spaces (Hug and Mason 2022). Such everyday practices can further help countering epistemic uncertainties about actions and intents, although uncertainties may increase again once information enters a politicized public space, as Keator and McNaboe and Kwaja (both, this article) also discuss in relation to social media.

Most importantly, uncertainties about actions and intent only condition behavior if they are a salient obstacle to cooperative behavior. A conflict party that pursues a military advantage will find ways to return to violent conflict, regardless of its interpretation of the opponent's behavior (Clayton and Sticher 2021; Sticher and Vuković 2021).

The Role of New Technologies in Cease-Fire Monitoring

We now turn to the case of the OSCE Special Monitoring Mission (SMM) to Ukraine—prior to the suspension of its activities in early March 2022—to assess how the use of these technologies affected monitors' ability to address un-certainties at both the mission level and among the conflict parties. We focus on the SMM as it is the most technologically advanced cease-fire monitoring mission deployed to date.

The SMM was established in 2014 "to observe and report in an impartial and objective way on the situation in Ukraine" (OSCE 2022). In its daily reports, the SMM routinely recorded hundreds, if not thousands, of cease-fire violations, mostly of a minor nature. The volume of incidents would be impossible to record without the use of technology. Machine recordings (acoustic sensors, video cameras, satellite images, and uncrewed aerial vehicles [UAVs]) were therefore essential to the production of data by the SMM. Adopting technology was motivated by demands to continue monitoring at night, when direct visual observation was evidently unfeasible, and by concerns over the safety of unarmed monitors (Haug 2016; Giardullo, Dorn, and Stodilka 2020). Some argue that the SMM's use of technology was "cutting-edge" (Kemp 2018, 117), even an effective force multiplier (Wittkowsky 2021). But did technology enable the mission to address its own un-certainties and those of the conflict parties?

For the mission itself, our assessment is mixed. Sensory tools allowed the monitors to gather primary information, verify alleged violations, and work at night, creating information that may otherwise not be available to them. Primary information was particularly important in a context characterized by the systematic use of disinformation by the conflict parties (see Higgins 2021). Given the vast theater of conflict, and with limited resources and operational security concerns (Haug 2016; Giardullo, Dorn, and Stodilka 2020; Hug 2021), the mission would have been unable to gather and verify some information in the absence of these technologies. Still, this collection of primary information was highly selective. Most remote sensing work was concentrated along the line of control, and not in other areas of eastern Ukraine. Monitors decided when and where to deploy remote monitoring technology and with what purpose, analyzed only some of the data gathered by the

sensors, and interpreted data through the prism of information gathered by eyewitness monitors, suggesting that the use of technology offered more complementarity to human monitors than substitution (Diehl 2002).

Using sensory technologies helped monitors overcome some obstacles of the monitoring context, and thus reduced the mission's epistemic uncertainty about the circumstances of some cease-fire violations, enabling it to confidently produce detailed findings about violations. Still, different technologies contribute differently to reducing epistemic uncertainties, even when they appear quite similar. Within the seemingly similar use of UAVs, for example, many former monitors attributed greater importance to short-range UAVs than those with longer range, given the speed with which short-range UAVs could be deployed and their data analyzed (Sticher and Verjee 2023). Moreover, the value of any apparent reduction of third-party epistemic uncertainty by the availability of sensory monitoring data was limited by the interpretation of the SMM's mandate, which precluded attributing violations to any belligerent. The inability of the mission to name the perpetrator, and much less to directly sanction violations, limited the costs conflict parties faced for cease-fire violations. As one former SMM official noted, "it is easy to count" violations as long as they are unattributed (former SMM official, online event, April 2021).

For the conflict parties, our assessment of the effects of the mission's technology is even more pessimistic. Arguably, epistemic uncertainty about what happened on the ground was not the key obstacle to conflict settlement. Instead, cease-fire violations often served to turn up the heat in reaction to political tensions, and each side appeared convinced of the other's bad faith (ontological certainty), which events from February 2022 onward seem to affirm. In this context, greater epistemic certainty about cease-fire violations does little to shape perceptions of intent and resolve. Therefore, despite the apparent definitiveness of visual or audio recordings, the ontological stances of the conflict parties remained unchanged, a challenge echoed in the dialogue facilitation process in Ukraine (see Kyelova and Hirblinger, this article). Perhaps most important for the resolution of the conflict, more sophisticated monitoring was resisted by the parties and did not serve to de-escalate tensions nor improve relations among the conflict parties. Ultimately, although the SMM pioneered technologies that are not commonly used in cease-fire monitoring, and created significant amounts of new information, little has changed in the balance of uncertainties, especially between the conflict protagonists.

Taking Monitoring beyond the Epistemic Dimension

The case of the SMM illustrates the changes technology has brought to contemporary cease-fire monitoring. At a basic functional level, the use of new technologies by cease-fire monitors is intended to create more information about cease-fire violations, more quickly and more systematically. If cease-fire monitors have tools that are unavailable to the conflict parties, then monitors could conceivably regain a position of superiority in credible information provision—compared to that of the conflict parties themselves—or at least reduce the gap that exists. This offers monitoring missions the possibility to address their own epistemic uncertainties and those of other third-party actors, such as mediators or state actors with access to and trust in the mission's findings. By using technology, missions can also disseminate findings more quickly and more widely, including to the public. This is historically uncommon in cease-fire monitoring (Verjee 2019). How conflict parties and third parties act upon such information determines whether there is any effect on conflict dynamics, as the Ukraine case illustrates. However, information gathered and verified through remote sensing means appears less effective in shaping conflict parties' stances on an ontological level—that is, they struggle to create the ontological uncertainty necessary for conflict parties to question deeply ingrained views about the other parties and their intentions. Conflict parties often possess information that

third parties do not, and technical data gathered by technological means lack the narrative dimension that might enable actors to determine resolve and intent. Most importantly, remote sensing technology does not change the fundamental problem that cease-fire monitoring missions face in contexts where parties lack the intent to fully comply with a cease-fire, and where third parties are not willing or able to sanction violations in a way that would change the cost–benefit analysis of cease-fire compliance (Verjee 2022). While remote sensing faces particular difficulties when it comes to reducing challenges associated with ontological un-certainty, the next contribution highlights how third parties may be able to engage with conflict parties on the ontological level through dialogue efforts, including online. This points to the benefits of thinking about technology-supported interventions in a holistic manner, instead of searching for a “one-size-fits-all” solution.

In conclusion, policymakers and peacemakers should not assume that adding remote sensing technology to cease-fire monitoring missions will reduce challenges associated with all types of un-certainty. Rather, when designing or supporting such missions, they should seek to match technology to the specific uncertainties of the conflict context and to what end data are gathered, while keeping in mind the wider implications of the advantages and disadvantages of such technological means.

Online Technologies in Facilitated Dialogue: Challenges of Navigating Un-Certainty in Ukraine

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Digital technologies also play an increasing role in the facilitation of dialogue to resolve and transform armed conflict. To explore the relationship between un-certainty and technology, we focus on online dialogues conducted by Ukrainian facilitators before the large-scale invasion of Russia in February 2022. Overall, Ukraine has seen hundreds of dialogues in the 2014–2021 period, mostly at civil society and “grassroots” level. The utmost majority of these dialogues did not directly involve people from the Non-Government Controlled Area (NGCA) or Russia, and thus had only an indirect connection to the high-level Minsk negotiation process (Kyselova 2018). Nonetheless, these dialogue efforts were meant to contribute to the peace process by building trust, reducing tensions, and resolving concrete problems in and among communities. Our discussion draws on insights from about a dozen online dialogues held in the period 2020–21, two of which engaged people from Ukraine as well as from the NGCA or Russia. Most of these dialogues were conducted online due to the COVID-19 pandemic. Yet, one notable case—the platform “Donbass Dialogue”—was specifically designed for online formats and has organized dialogues across the line of contact since 2014 (Donetsk Regional Mediation Group 2014).

Ukrainian facilitators understand dialogues as “a specially prepared group process that takes place with the help of a facilitator,” which “aims to improve the understanding/relationships between participants,” and may have the goal of “making decisions about common actions or the resolution of a conflict” (Institute for Peace and Common Ground 2018). Whether online or face to face, dialogues usually entail activities aimed at building understanding and trust between the participants and may also include problem-solving activities to reach concrete

agreements. While trust-building primarily works on an ontological level, engaging with the established narratives, beliefs, and views of participants, problem-solving plays out primarily on an epistemic level, defining what the problem is and how it can be addressed.

Existing research on online dialogues points to their benefits, such as better accessibility and a higher frequency of meetings, but likewise to challenges such as guaranteeing inclusiveness or confidentiality (Bramsen and Hagemann 2021). Our contribution discusses how various types of un-certainty interact with online dialogue efforts. More specifically, we demonstrate that the digitalization of peace processes provides new opportunities for information warfare that creates high levels of epistemic uncertainty. In such contexts, online problem-solving tends to be reduced to marginal aspects of the conflict instead of the larger conflict system. Therefore, facilitators may prefer to tackle the ontological dimensions of conflict, aiming to enable transformative encounters (Saunders 2009). Our contribution points to several challenges that arise in efforts to support conflict transformation through online dialogues and highlights their implications for policy and practice.⁵

Online Problem-Solving versus Trust-Building in Contexts of Epistemic Uncertainty

Before the Russian invasion in 2022, the conflict in Ukraine was largely perceived as caused by competing geopolitical ambitions between Russia and the Western States, underpinned by an ideological struggle and competing narratives of the conflict itself. The insurgency of pro-Russian separatists in the Donbas region was accompanied by forms of hybrid warfare that operated through the spread of disinformation and misinformation, (re-)producing competing conflict narratives through mass media and social media (Malyarenko and Wolff 2018; Lazarenko 2019). However, in contrast to several civil society initiatives aimed to counter disinformation (see, e.g., “Detector Media (Детектор Медіа)” 2022; “StopFake.org” 2022), Ukrainian dialogue facilitators tend to avoid direct encounters with such disinformation. In their understanding, engaging with “fake” information used by participants to justify their positions would lead to an unfruitful discussion about what is “fake” and what is “real,” as one facilitator has argued, “such situations [are] more about people sharing something that supports their worldview” and therefore “it is not really an option to question their truth and to show them that it’s based on something fake. The only reaction that that will result in is a defensive reaction” (interview with dialogue facilitator, June 6, 2021).

Therefore, the problem-solving component of online dialogues tended to focus less on the larger conflict system but rather on smaller and more solvable issues, such as obtaining Ukrainian passports for NGCA inhabitants. Such problems can be clearly determined, that is, described in terms of facts that are recognized by all participants of a dialogue. Resolving them unites dialogue participants in a joint effort to ease the life of people. Yet, this also meant that one of the core problems of the conflict remained untackled, namely the diversity of truths produced by the media ecosystem, which sustained competing worldviews among the conflict-affected population.

However, the dialogue facilitators also worked on the ontological dimension of conflict, through a range of “trust-building” activities that engaged with what lies below the narratives and beliefs that form part of conflicting identities. According to one facilitator, the objective would be to “dig deeper because these things [the contested facts] are usually not all that makes up this person’s identity. They are

⁵ Our argument is built on an explorative case study of online dialogues based on seven semi-structured online interviews with Ukrainian dialogue facilitators conducted in June–July 2021, and participatory observation of the week-long online/offline dialogue marathon of the “Donbas Dialogue” platform in Svatohirsk, Eastern Ukraine, in May 2020.

only one part of this person's identity. There are other parts of this person's identity that I could try to explore and understand [...]" (interview with dialogue facilitator, June 6, 2021). Thus, supporting conflict resolution in Ukraine via online dialogue became less an epistemic and more an ontological challenge: one that needed to be addressed less by seeking epistemic certainty through debunking disinformation, but by working with the participant's identities and relationships and building trust between them.

Navigating Ontological Un-Certainty: Opportunities and Limits of Online Dialogues

Working on the ontological level, online dialogues encourage participants to question their established beliefs and narratives about the conflict to rearrange or transform the relationships between the conflict parties. They thus create ontological uncertainty at first and then encourage new, more reconcilable ontologies that can form the framework for less hostile and more trusted relationships. The use of digital technology in online dialogues poses a range of opportunities and limits to this endeavor, discussed in the following:

ESTABLISHING A SAFE SPACE

Dialogues commonly require a safe space in which the participants can freely voice and question their worldviews without being concerned with the consequences that such ontological shifts could have. Establishing safe spaces for conventional offline dialogues would usually be cost-intensive, particularly if dialogues take place across the contact line. In contrast, online platforms can easily establish spaces for communication between physically separated participants. When meeting online, participants remain in the comfort of their homes, "in the dress they like, eating the food they like and drinking the drinks they like" (interview with dialogue facilitator working in Ukraine, June 14, 2021), which creates a feeling of comfort and safety. Meeting online also reduces the risk of physical assaults among the participants. However, it makes it more difficult to deal with negative emotions that come with worldviews, as one facilitator argued:

The absence of physical contact is good for the participants—they cannot fight but emotions still run high. During offline sessions I know how to deal with such situations. In an online format it is much harder and takes longer. You need to prepare the break-out room, instruct the participants and manage the remaining large group and the difficult conversation in the break-out room. (Interview via Zoom with dialogue facilitator working in Ukraine, June 6, 2021)

However, online dialogues also bring new security risks to the confidentiality of the process, such as unauthorized access to computers. For participants from the areas with repressive authoritarian regimes this may lead to undeniable evidence of their participation in dialogues, which increases the risk of illegal detention or torture (interview with dialogue facilitator working in Ukraine, June 10, 2021). To reduce this threat, the Donbas Dialogue platform, for example, uses peer-to-peer technology that allows anonymous connection without prior authorization. Their tailor-made conferencing software can also conceal the participants' identity, including by blurring their faces and using pseudonyms. Such measures create a sense of greater safety and security for the participants, but they may also negatively impact the facilitators' ability to create an immersive environment.

IMMERSION INTO DIALOGUE

To be immersed into the dialogue, processes participants must be fully devoted to the dialogue process. However, in an online format, the very same advantages of online technology that allowed for constructing a safe space discussed above present a hindrance to immersion. As dialogue facilitators and participants remain at home, they are often distracted from the dialogue process, for instance, while attending to children and relatives, preparing meals, or being exposed to noise from the neighbors. While the participants were asked to have their cameras on, some did not follow this suggestion, leaving their faces, appearances, and emotions hidden—not involving themselves fully in the dialogue and not allowing others to get in close contact with them. The possibility to switch the camera off at any moment enables participants to switch between the two worlds—the intimate dialogue process and the everyday home routine.

Moreover, working online required more time to brief the people on technical issues, to restore the conversation when connection breaks, to prepare the platform and share other internet resources, and to monitor the chat. Such technical aspects may distract facilitator as well as participants from the actual task of trust-building in dialogue. This negatively affects the identification of the participants with the dialogue group, their motivation to continuously take part in the dialogue, and their attachment to the dialogue process, thereby negatively influencing the immersion process in online dialogues. Moreover, the virtualization of dialogues made informal contacts that usually take part during breaks, meals, and leisure time in the physical setting impossible. In response to this challenge, facilitators had to sustain contact in between online dialogue sessions through the asynchronous facilitated chats in Facebook groups, messengers, or devised structured activities by participants, such as virtual guided tours of hometowns. This blurred the borders between the dialogue and non-dialogue time and required greater efforts of dialogue facilitators.

ENCOUNTERING THE OTHER

Dialogues aim to provide opportunities for encounters with the Other that could support the transformation of relations. Yet, online dialogue formats make this process more difficult. In particular, the asynchronous online communication in between dialogue sessions decreases facilitators' ability to manage the process and bears higher risks of polarization compared to face-to-face communication. As one facilitator put it, "people are a lot more polarized online" and "much more reactive, much quicker to judge and to categorize and then to stereotype in online communication." This "creates a very toxic environment where it is difficult to promote and facilitate constructive dialogue" (interview with dialogue facilitator, June 6, 2021).

Furthermore, encountering the Other in online dialogues requires an authentically perceived presence of the Other and the Self. However, certain aspects of the technical design of online meeting platforms hindered the development of an authentic dialogue experience. For instance, participants viewed themselves on the screen alongside images of the dialogue facilitator and other participants. Rather than engaging with how other participants appear, they found themselves concerned with looking unattractive, speaking poorly, or reacting improperly to someone else's remarks. Therefore, the use of videoconferencing created a heightened self-awareness among the participants, and the perception that the exchange was a staged media event, rather than an authentic encounter. In response, some participants decided to switch off their camera, which considerably reduced the degree of immersion of the encounter with others.⁶

⁶ Some platforms allow the user to switch off the self-view, but this possibility seems not to have been used.

Aiming to mitigate the negative effects of the online platform, the facilitators aimed to overcome the participant's awkwardness that resulted from the medially staged encounters. However, the means used to facilitate the interaction between the participants, such as empathically rephrasing the participants' statements or asking follow-up questions, resembled offline settings. This suggests that the ability to overcome the shortcomings of technology in enabling fruitful forms of ontological uncertainty seems less the result of innovation in digital technology, than of the human skill of dialogue facilitators.

Consider Human Skills and Technical Capacities

In conflict contexts such as Ukraine, epistemic certainty seems impossible to establish. Rather than thinking about digital technologies as tools that can produce "data" and "evidence" in support of dialogue efforts, our contribution points to the merits of using them to help build trust, by working on the worldviews and narratives of populations in conflict. The technologies employed in online dialogues bring several advantages and disadvantages to the facilitators' effort to deconstruct existing conflict ontologies and build new ones that can be more amenable to peaceful co-existence. Our findings confirm that online interactions may hamper what [Bramsen and Hagemann \(2021\)](#) called a "sense of peace" composed of "understanding, togetherness and trust." In such contexts, the skills and abilities of dialogue facilitators are crucial in efforts to enable transformative encounters that can help to destabilize hurtful ontologies. Therefore, while online platforms may be a suitable addition to overcome challenges related to insecurity and access, dialogue efforts should ideally follow a hybrid approach that combines online and offline activities. Dealing with the un-certainty of peace processes is as much as technical as a human challenge. Therefore, policymakers and practitioners should carefully consider the interplay between human skills and technical capacities, when supporting, designing, or implementing online dialogues.

Peacebuilding from Below: How Social Media Shapes Un-Certainty and Influences Peace and Conflict in Nigeria

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Introduction

In June 2021, the government of Nigeria banned Twitter, knocking millions of Nigerians off the social media platform. The government's action was motivated by Twitter's deletion of inflammatory tweets by President Muhammadu Buhari and its suspension of the president's account ([Bagwaiya 2021](#)), putting Nigeria—a country with a vibrant democracy and free media—in the company of digital authoritarians. Despite Twitter comprising a small portion of Nigeria's tens of millions of social media users, who themselves are still a minority of the population of more than 200 million, the ban illustrated the outsized importance of the platform in Nigerian politics and in matters of peace and conflict. Although Nigeria would be typically characterized as being on the wrong side of the global digital divide ([Adeleke 2021](#)), in recent years, social media, including Twitter, has sparked numerous social

and protest movements, such as Bring Back Our Girls, Occupy Nigeria, and hashtag campaigns such as #EndSARS, #WeNeedPeace, and #FaceOfPeace.

Despite the uneven digital penetration in the country (Kemp 2022), social media has come to constitute a place for social resistance and mobilization, beyond elite actors, and thus a means of peacebuilding from below. Practitioners and analysts increasingly rely on social media to track, analyze, and map actors, causes, and responses to conflict (Iroka 2016). Government and communities are highly dependent on social media platforms and content in monitoring early warning signs to conflict (Ogundipe 2019). Digitalization and the spread of social media have also opened new avenues and spaces for civic participation and collective action. For instance, previous research, such as the State of Peace in Nigeria study, leveraged social media to mobilize respondents, using Facebook, which was particularly challenging during a period of COVID-19 restrictions (Bukar, Kwaja, and Verjee 2021). Many peacebuilders are tapping into online communities using Facebook, Twitter, WhatsApp, and other platforms to mobilize people for peace. This includes providing marginalized communities with the opportunity of participating in governance and peacebuilding efforts, overcoming the disparities associated with access to information. For peace practitioners, this represents a critical pathway for knowledge production, dissemination, and usage through access to varied forms of technology.

I argue in the following that social media has the potential to positively reconfigure the relationship between Nigerian citizens and state, by enabling decentralized forms of digital peacebuilding. In this process, social media provides citizens with new abilities to analyze and confirm information—thus addressing problems related to epistemic certainty. Moreover, the use of social media by ordinary people can contribute to challenging and reconstituting ontologies of conflict, traversing deep-set identity fault lines by creating ontological uncertainty (Agbo, Ugwuanyi, and Obieluem 2021).

From Occupy Nigeria to #EndSARS

The 2012 “Occupy Nigeria Protest” against the government of President Goodluck Jonathan was an early example of social media serving to mobilize Nigerian protesters. Traditional media came under government pressure to suppress reporting on the protest. However, this action by the government against the media motivated people to resort to social media platforms such as WhatsApp and Facebook to organize and disseminate news. Such a move by the people was a clear message to the government about the potency of people’s power to share information and increase transparency in moments of political crisis in the pursuit of their collective interest. The Bring Back Our Girls campaign, sparked by the abduction of the Chibok schoolgirls in 2014, has also largely played out on social media (Iroka 2016). Although some of the response has been critiqued as a distorted manifestation of global advocacy (Parkinson and Hinshaw 2021), it has also served as a template for social action in light of the many subsequent kidnappings and abductions that have occurred in Nigeria (Verjee and Kwaja 2021). Most recently, the #EndSARS protests against the Nigerian police, as well as the enforcement of COVID-19 restrictions by the security agencies, were also constructed and coordinated using social media. #EndSARS was driven when people became aware of graphic police misconduct that was visually documented and disseminated on social media (Verjee and Kwaja 2020).

These three cases have in common that they supported peace efforts in epistemic and ontological ways through immense public engagement facilitated by “an audience interpretation of images and their accompanying comments,” generated on Facebook and WhatsApp (Agbo, Ugwuanyi, and Obieluem 2021, 19). Visual images are potent tools for community mobilization given that they can more easily

travel and reach audiences irrespective of distance. Social media has played a role in strengthening people's resolve and desire for peace, by amplifying their individual and collective voices. In remote areas of Nigeria where infrastructure and transportation services are lacking, internet connectivity has made it easier for people to more quickly access such information, whether written or pictorial (Zeitoff 2017)—and it has thus provided new opportunities for citizen participation. However, this decentralization of communication via social media has also led to a fragmenting of information flows across a disparate federation, which has made understanding the level or extent of peacefulness in Nigeria less ascertainable, intelligible, and predictable (Adegbami 2020).

Building Trust by Countering Misinformation

Nigerian social media is not immune to the mistrust and disinformation problems that can be witnessed globally, and it has contributed to both social polarization and cognitive biases in an environment of persistent national insecurity. In the run-up to the 2019 presidential elections, it was reported that the two dominant political parties ran media operations that were focused on disseminating misinformation. President Muhammadu Buhari of the All People's Congress (APC) was touted as "dead" and replaced with someone of foreign origin instead. Atiku Abubakar of the People's Democratic Party (PDP) was also targeted: his campaign was reported to be sponsored by the LGBT community, which in conservative Nigeria was considered a slur (Anderson 2019). This trend prompted the Centre for Democracy and Development (CDD), one of Nigeria's active civil society organizations, to launch a project on fact-checking, with the goal of ascertaining the veracity and authenticity of information shared across social media platforms. For a fact-checking organization such as the CDD, such targeted messages that misinform people create divisions in a country that is highly divided along ethnic and religious lines.

While the dissemination of hate speech on social media is well known, social media has also become an effective counternarrative tool against rumors and misinformation. In the run-up to the 2015 elections, social media became a tool for dispelling rumors. For example, it was reported that following a gas explosion, an event that had been associated with Boko Haram insurgent attacks, social media was used to provide accurate information, thereby preventing further problematic consequences (International Alert 2020). The effectiveness of the counter messages stems from the credibility of the sources, such as social media influencers, celebrities, and religious and political leaders, due to the influence that such sources have on the individual and collective psyche of the people. Countering misinformation can thus be a tool to build epistemic certainty from the bottom—and to build trust among citizens and between citizens and the state. However, overall on social media, epistemic uncertainty is reduced and increased concurrently. This dual influence both sets and shapes the agenda of a range of participants, both those explicitly setting out to achieve peace, and those trying to undermine it.

Transcending Bias and Challenging Ontological Certainties

One limitation is that information shared and retrieved on social media is not only often viewed as factually wrong, but that is commonly biased. The tendency to search and interpret information in ways that confirm or support existing viewpoints or beliefs makes it difficult to challenge ontological certainty that stands in the way of peace. For instance, the current debate over power rotation in Nigeria's political system is one in which the country is highly divided along regional, ethnic, and religious actors, with each of the actors perceiving the action or inaction of the other(s) as more or less a confirmation of its perceived marginalization. For the Igbos of the south-east region, the actions of the Hausa-Fulani of the north as it

plays out in the activities of the two dominant political parties—the APC and PDP—do not show any visible sign of allowing the south-east to produce the presidential candidate in the run-up to the 2023 elections.

In this context, social media is playing a major role in the propagation of one-sided and often biased messages (Duford 2019). This is often done by mixing fact and fiction in ways that correspond with the beliefs and views of the social media users and the group they identify with (Bakare 2020). Therefore, the bias that many citizens hold for or against a particular information is further bolstered by the attention such information receives across several social media platforms. This serves as an important avenue for validating the information, largely by focusing on its relevance and source. In the face of rising mistrust against state officials, people's reliance on messaging from faith groups and leaders soared, due to the level of influence these actors have on them.

On the other hand, social media has become a key tool for mobilization across identity fault lines. In Nigeria, issues relating to conflict, peace, and security are often shaped along a discourse of the Other, where voices from the Christian-dominated south critique those in the Muslim-dominated north and vice versa, without much care for nuance. In a society where most of its people are affiliated to one religious group or another, the adherents of these religions are highly dependent on social media as a medium for information and exchange of communication. By providing new information in different formats with authentic credibility, social media has helped to challenge long-standing ontological frames, causing people to question their own beliefs about identity, belonging, and their position vis-à-vis the state. These ontologies are not necessarily permanently transformed; by their very nature, the character of social protest movements is ephemeral and transitional. But without the forum provided by social media, even this limited challenging of established ontological certainties would have been absent. Social media's systematic information function has helped connect citizens to “relatable themes and individuals with lived experiences of conflict” in a way that previously did not occur (Kotsiras 2020, 3).

Conclusion

As more and more people access their information online, social media's prominence has had an impact on society beyond the application of technology itself. Increasingly, everyone is both a potential producer and consumer of online content, with the ability and capacity not only to shape and influence the understanding and responses to topical issues, but also to challenge and constrain the opportunities for epistemic and ontological uncertainty. How we understand and respond to social media content is a key determinant of peace and conflict. This defines the double-edged power of social media to both destroy and make peace.

In Nigeria, social media has proven its potential to be a tool for peacebuilding from below, for instance, by enabling communication across ethnic groups that destabilizes ontological certainties that can be exploited in conflict. However, at the same time, social media continues to produce epistemic uncertainties that can be harmful and destabilizing for the nation. In countries like Nigeria, our ability to monitor and assess these dynamics is currently very limited, due to unequal access and usage. We therefore require more partnerships involving research and practice, to better understand how peacebuilders can use social media to foster productive types of uncertainty, while holding unproductive types at bay. As the effects of digitalization not only differ across contexts but also change rapidly, both comparative and long-term studies are duly required.

Conclusion

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While they vary in their assessment of the practicalities of using technology to generate un-certainty during peace processes, the contributions in this forum article all speak to an interesting contradiction of contemporary life: on the one hand, advances in modern technology have led to an exponential growth in our ability to gather, analyze, and disseminate data in conflict-affected contexts. Remote technologies have increased our ability to reach marginalized and difficult-to-reach populations living in war zones and allowed them to communicate to the outside world their first-hand experiences of conflict. On the other hand, this unprecedented access to knowledge and information from conflict zones has not translated into providing meaningful clarity for peacebuilders about *how* they should intervene or indeed any further certainty about what the future may hold. However, one observation resounds throughout this forum: the uses of technology—and the certainties and uncertainties they bring for peace processes—are ultimately conditioned by human political dynamics.

The failure of technological advances to provide peacebuilders with greater certainty only seems paradoxical if one assumes that certainty can be found through the uncovering of more empirical evidence, when in reality, it is likely that more information will generate more uncertainty. Segal's law, which states that a man with one watch knows what time it is while a man with two watches is never sure, may be a useful metaphor through which to consider this phenomenon. There are two opposing ways to read this adage that may be worth considering when thinking about certainty in peace processes. For some, it can be read as a caution against complication—the man with just one watch can claim to “know” the time and act with confidence on that “fact” whereas the man with two watches may find himself crippled by the anxiety that at least one of those watches is wrong. For others, it is a caution against simplicity—the man with one watch is unaware that he is acting on potentially false information because he has never sought alternative counsel. The question for peacebuilders therefore is where their actions should err on this spectrum between (potentially misguided) certainty and (debilitating) uncertainty. The middle ground tendency of peacebuilders has been toward a sort of “triangulated certainty,” whereby a simple narrative is posited or “uncovered,” and more information is then sought to verify or back up that claim.

However, as Hirblinger observes in the introduction to this article, the use of technology to gather more data does not always lend itself to finding information that triangulates single (or indeed simple) narratives. Rather, the multifaceted ways in which technology has or can be used, particularly the democratizing effects of social media, have generated a multiplicity of narratives that have challenged ontological and epistemological certainty. Several contributions in this article explore the practical challenges this poses for the implementation of peace. Wählisch, for example, shows how predictive technologies have failed to generate meaningful results and concludes that “we need to embrace uncertainty in peace processes as there is no way around it but through it.” I would agree with this and go even further to argue that the use of technology to disrupt universalizing claims of knowledge by generating uncertainty is actually one of its key strengths. We can use technology effectively, as Duursma and Karlsrud show, to gather more evidence that can point to previously unknown complexities. However, seeking to derive some claim of certainty from these data is neither possible nor desirable.

Instead, we should recognize that conflict zones are *inherently sites of uncertainty* and that many of the dynamics that drive conflict and peace are imperceptible, incommensurable, and constantly changing. It is true that our current modes of

operating during transitions from war to peace are not particularly compatible with this reality. My own experience of conducting action-led research in the eastern Democratic Republic of the Congo has revealed on several occasions the problem of translating uncertain findings (Perera 2017) into tangible action (Perera 2018). Peacebuilders, no matter how willing they are to accept that more information often leads to a messier and more complex picture of what is happening on the ground, are poorly equipped to deal with that reality. Time and resource constraints mean that practitioners need to be able to work from “evidence” that is premised on simple and clear causal links. More or contradictory data might be unhelpful because it could create epistemological uncertainties that cast doubt on the axiom that what they are seeking to achieve, and the way that they’re seeking to achieve it, even if it is not perfect, is overall doing good. However, this type of ontological certainty (and the epistemological certainties through which it is supported) is also what facilitates the continuation of peacebuilding practices that have been widely criticized at best as ineffective if not actively preventing the realization of just and sustainable peace by perpetuating the coloniality of power. Creating certainty requires silencing and erasing narratives that challenge this certainty. This practice, which is rooted in the colonial practices of the late-fifteenth and -sixteenth centuries (Grosfoguel 2015), will always benefit the powerful at the expense of the marginalized. In the context of peace processes, universalizing narratives center the needs and knowledge of Western-centric intervenors as the main community of “knowers,” and what they do not know gets displaced (Cadena and Blaser 2018). Those who have alternative knowledges and experiences of peace and conflict therefore face epistemic injustice (Fricker 1999), whereby their epistemologies are either never heard or regarded as unreliable or lesser knowledge.

Decolonial scholars have argued for overcoming the epistemic injustices perpetuated by (colonizing) universal narratives by thinking pluriversally—in other words, recognizing that there is not one single version or rational understanding of the world, but rather a world in which many worlds fit (Mignolo 2018). In the process of making peace, where external interventions are often accused of imposing culturally inappropriate and/or neoimperialist versions of peace (Koddenbrock 2012; Mac Ginty and Richmond 2013; Cruz 2021), pluriversal thinking is necessary to overcome the limits of top-down liberal peacebuilding. It is here that uncertainty can have analytical and practical value. If we acknowledge that evidence diverges from (rather than converges toward) a single universalizing narrative as we collect more data, we can reframe how we understand conflict and what we value as conflict knowledge for analytical purposes. And once we change our understandings, we can begin to program differently because our assumptions are no longer reified as self-evident truths.

Technology, particularly the use of social media and citizen journalism in sites of conflict, has been at the forefront of creating space for pluriversal thinking. Knowledge produced from “standpoint epistemologies” (Santos 2014)—through struggle, from those most affected by conflict and invested in peace—can now be communicated globally. This, in turn, has challenged long-held peacebuilding orthodoxies and practices and opened up spaces for dialogue about genuine change. While there is still a long way to go before oppressive structures are truly dismantled and transformative change is fully achieved (not least in the power structures of the technology itself), we should be encouraged that this increasing ability of marginalized groups to speak truth about (and sometimes even to) power has emerged. This ability exists precisely because technology can generate and reveal uncertainty. Uncertainty is therefore not something we should seek to eliminate, but rather something we should embrace while focusing our attention on how we can better work with and harness it.

Acknowledgments

The views expressed in this forum article are those of the authors and do not necessarily reflect those of the United Nations or other represented organizations. The authors would like to thank Sara Kallis and Fabian Hofmann for their valuable support in editing this forum article.

Funder Information

Parts of the research for this forum article were financially supported by the Swiss National Science Foundation. Andreas Hirblinger received funding through grant number 190687 and Valerie Sticher received funding through grant number 202993. John Karlsrud received funding from the Norwegian Ministry of Foreign Affairs to undertake his part of the research.

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