The "latecomers" of Bougainville: The difficult completion of post-conflict disarmament processes

Theò Bajon

theobajon@gmail.com

https://orcid.org/0000-0002-3376-2859

Center for Research on International Security and European Cooperation, 1133 Rue des Résidences, 38400 Saint-Martin d'Hères (France)

Abstract

Post-conflict disarmament processes inherently grapple with definitional challenges regarding definitive endpoints and measures of completion. This paper examines the phenomenon of delayed disarmament through the case study of so-called "latecomers" in Bougainville—ex-combatants who voluntarily surrendered their weapons following the cessation of formal demobilisation, disarmament, and reintegration programming. This study proposes a behavioural model that conceptualises late comer decision-making dynamics pertaining to temporary small arms retention. Pivoting upon an iterated security dilemma framework, the model posits that contextual environmental stressors and temporal factors serve as key variables initially sustaining weapons possession in the absence of hostilities. However, this intermediate status carries risks of eventual escalation to renewed violence or protracted and arduous disarmament engagement. The latecomer case reveals the inherent fluidity and uncertainties surrounding delimitations of the disarmament process. Further interrogating ex-combatant dilemmas could strengthen post-conflict policy and practice. Fundamentally, this research demonstrates the enduring temporal ambiguities inherent to disarmament, highlighting the need for pluralistic understandings attentive to issues of indigeneity, humanity, and interpretive meaning central to sustainable peace-building.

Keywords:

disarmament, peace-building, DDR processes, conflict, ex-combatant behaviour

Introduction

Disarmament processes in post-conflict situations have attracted significant research attention, especially regarding the implementation of DDR—Disarmament, Demobilisation and Reintegration—policies, with focuses on the procedural, functional and impacting aspects of disarmament (Renner, 1997). This interest stems from the importance of disarmament for peace-building and the constant search for concrete impacts on post-conflict society. However, as Muggah (2005, p. 245) notes, there is neither consensus on how to effectively define and implement the phases of DDR, nor on determining the duration and endpoint of disarmament processes.

A key, yet underexamined, question is how to effectively define and implement the phases of DDR as well as to delineate when a disarmament process is truly ended, thus determining the duration and endpoint of disarmament processes in specific post-conflict contexts. This issue is closely linked to peace-building, conflict management, and risks of renewed escalation. As Boshoff (2007, p. 59) explains, disarmament in the Democratic Republic of Congo faced ongoing challenges, exemplifying the potential for a "never-ending story" in some post-conflict contexts. A clearer understanding is needed of how specific disarmament process designs and directions influence completion and long-term impacts, which can strengthen upstream planning and programming (Moore, 2017).

This challenge is exemplified through the case of Bougainville. The Bougainville post-conflict case offers an informative lens, with interesting hindsight, into the prolonged course of disarmament. From 1988 to 1998, Bougainville experienced a protracted civil war fuelled by tensions over secession and control of mineral resources. Although peace agreements were reached in 1998 and 2001, complete disarmament of all ex-combatants proved difficult due to several factors, including divisions among groups. Between 1998 and 2005, a major effort, overseen by the United Nations, saw thousands of weapons collected from many former combatants. However, a gap in the existing literature centres on the subsequent period from 2005–2019, when reports emerged of "latecomers"—ex-combatants who opted to surrender arms after official programmes concluded.

This paper focuses on the particular phenomenon of "latecomer" ex-combatants who surrendered weapons only after the official disarmament activities ended. Prior literature on Bougainville has examined the initial disarmament processes but provided limited perspective on delayed disarmament completion.

Through developing a behavioural model grounded in evidence from this understudied phenomenon in Bougainville, this study seeks to advance understanding of post-conflict disarmament timelines and dynamics in the specific context of addressing gaps in understanding the Bougainville case. The model focuses on a proposed security dilemma influencing ex-combatant weapons retention and highlights the decisiveness of time for successful disarmament. Broader study of latecomer disarmament can improve understanding of process endpoints and support more effective policy design.

The long post-conflict process of Bougainville

The Bougainville Civil War was an intensely violent conflict that took place from 1988 to 1998, fuelled by tensions over Bougainville's push for independence from Papua New Guinea (PNG) and control of lucrative copper mining operations, with reverberations beyond the formal end date, despite the signing of peace agreements in 1998 and 2001

(Braithwaite *et al.*, 2010). The conflict was based around rivalries between PNG forces and the forces of the Bougainville Revolutionary Army (BRA), although at times the fighting crossed into civil strife between different Bougainville groups (Cochrane, 2017, p. 15).

The 2001 peace agreement laid the groundwork for political resolution and military disarmament through a United Nations-monitored disarmament process, led by the United Nations Political Office in Bougainville (Regan, 2002, p. 114). Although many combatants disarmed and reintegrated politically or privately, a minority refused to surrender their weapons, under the aegis of the Meekamui Defence Force (MDF), which retained territorial control.

This initial ambivalence exemplifies the inherent challenges of disarmament in post-conflict situations. The absence of a common enemy and internal divisions among combatants often emerge as obstacles to immediate peace-building (Mansoob Murshed, 2009, p. 89).

From 1998 to 2005, prominent disarmament activities yielded significant weapons reductions, with between 2,000 (Breen, 2016) and 6,100 weapons collected, sealed, and/or destroyed (McKenna, 2019, p. 19) mostly through a guns-in-boxes approach, surrendered by ex-combatants (Spark and Bailey, 2005, p. 603). Factors specific to Bougainville, such as information gaps and women's cultural roles, impacted disarmament processes both positively and negatively (Tankunani Sirivi and Taleo Havini, 2004, p. 170).

The United Nations, and in particular the United Nations Political Office in Bougainville (UNPOB), conducted substantial weapons disposal under a broader DDR framework to build peace. A key reintegration approach was enabling political aspirations towards Bougainville independence. Yet nearly 20 years post-conflict, total disarmament remained incomplete, exemplified by "latecomer" ex-combatants eventually surrendering weapons whether or not interim clashes occurred.

This paper analyses these "latecomers" to improve understanding of disarmament process timelines and endpoints, as prior studies on the Bougainville case, and post-conflict disarmament generally, largely focused on initial disarmament without examining delayed completion factors (Braithwaite *et al.*, 2010), when the "latecomers" case can reveal ongoing obstacles to definitive process closure.

Bougainville "latecomers": Understanding the behaviour of ex-combatants in the face of disarmament

The term "latecomer" refers to a particular phenomenon, understudied in peace research, of ex-combatants who engage in disarmament only after the main DDR programme phases ended, which is a phenomenon that can be seen in the case of Bougainville (Paes, 2005, p. 254). Specifically, "latecomers" disarm during reintegration, having not participated in initial disarmament and demobilisation. Their delayed participation warrants examining what motivations and situations influence this behaviour amid post-conflict disarmament.

Bougainville's "latecomers" case offers particular insights. From 2005 to 2018, disarmament stalled despite ongoing security and peace-building work and existing local and

international structures for disarmament, as limited progress was made towards fully resolving tensions (Wallis, 2019, p. 177). However, the 2018–2019 period witnessed a notable second phase of disarmament with different challenges from the first phase.

Quantitative and geographical data depicts the second phase, between 2018 and 2019, based on compiled local reports and media sources (Figure 1).

This phase exhibited "semi-voluntary" disarmament as ex-combatants in Bougainville surrendered weapons to local authorities, although international entities still held oversight roles in these processes.

Geographically, weapons handovers occurred across Bougainville but were concentrated in the initial conflict epicentre and areas of continued tensions in the far south. Compared to the first phase's focal points, the second phase saw more peripheral concentrations of weapons handovers.

While "semi-voluntary", ex-combatant behaviour seems to have primarily responded to political pressures around the organisation of the independence referendum prescribed in the 2001 agreement (Wallis, 2012, p. 37). Guaranteed amnesty through 2020 also seems to have incentivised disarmament in this concentrated period in Bougainville.

The scale of weapon handovers indicated a distinct second phase, with hundreds of additional weapons surrendered (Figure 2) transpiring amid ongoing reintegration programmes (Boege and Rinck, 2019, p. 14).

However, some evidence suggests that interim fighting persisted with original weapons, blurring phase separation (Forsyth, 2019, p. 9). Nonetheless, the second phase filled certain first phase gaps, revealing ongoing obstacles to definitive disarmament completion. The "latecomer" case exemplifies the challenges of defining completion timelines based on Bougainville's protracted experience with post-conflict weapons relinquishment.

Figure 1. The geographical spread of disarmament in Bougainville between 2018 and 2019.

**Figure 2. Disarmament timeline and phases.**
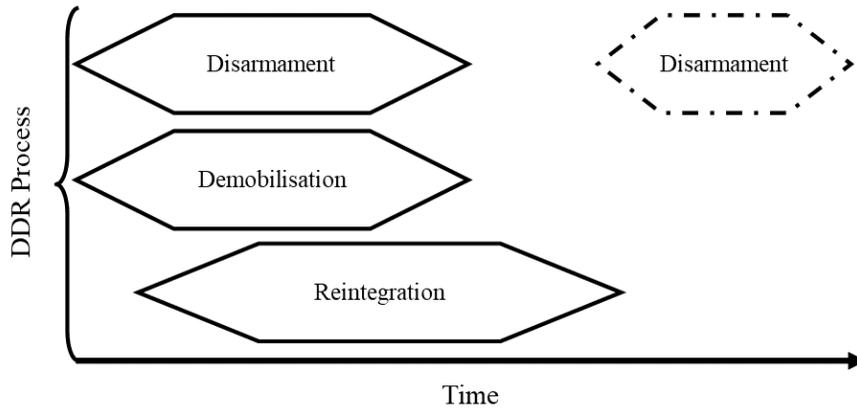
Modelling ex-combatants behaviour in post-conflict disarmament

To conceptualise factors influencing the array of ex-combatant post-conflict behaviours regarding disarmament, this paper established a general model based on evidence from the Bougainville case (Figure 3).

The model is generally placed in a post-conflict situation. The end of a conflict does not necessarily require the existence and signing of a peace agreement, just as a conflict can

Figure 3. General model of the behaviour of ex-combatants facing post-conflict disarmament.
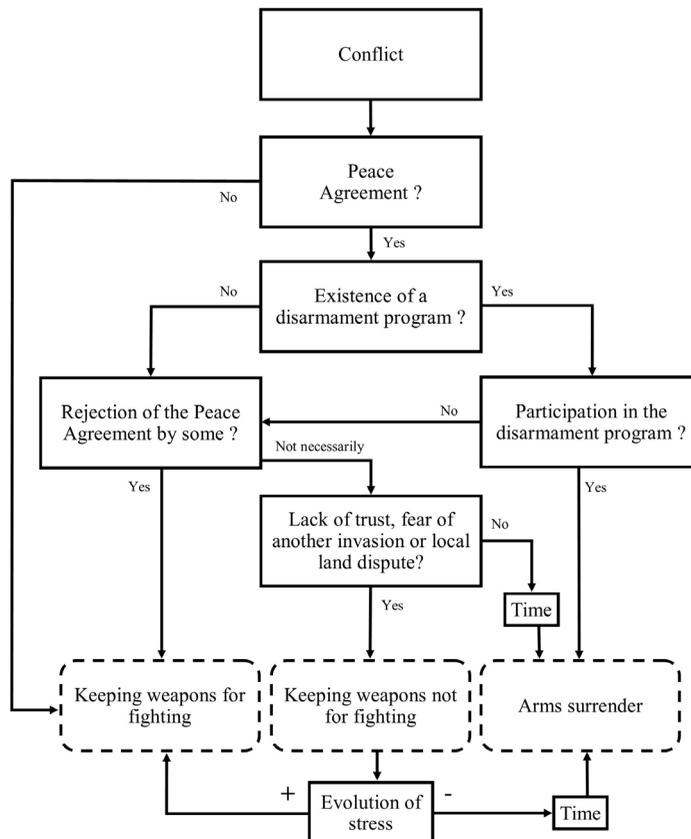
continue with the signing of a peace agreement. This logical approach can be challenging, and has been the focus of thoughtful examination in many academic writings on this subject matter (Aghedo, 2013, p. 278).

Nevertheless, the present model opts to conceptualise the absence of a peace accord as an extension of the conflict. This defining attribute aligns with a corpus of prior work that facilitates analysis of how peace agreements and broader peace processes affect conflict outcomes, particularly in instances of civil strife (Joshi and Quinn, 2017, pp. 20–21).

After a peace agreement has been signed, the next factor is whether a disarmament programme is implemented. The presence of a disarmament programme determines whether ex-combatants will have the chance to participate and give up their weapons. Disarmament programmes are usually connected to specific clauses in peace accords that enable some ex-fighters to take part in disarming processes (Cardenas *et al.*, 2016, pp. 374–375). However, even if a disarmament programme exists, not all former combatants end up being disarmed, despite the potential for "engagement" created by the peace agreement.

The nexus between ex-combatants and their participation in disarmament programmes or more expansive DDR efforts is fraught with profound challenges of both an individual psychological and broader contextual nature. Most importantly, ex-combatants are confronted with an atomistic, self-interested logic, conducting intrapersonal cost-benefit analyses to determine if partaking in post-conflict disarmament machinery accrues adequate personal advantage, mainly in the form of financial reintegration assistance or juridical amnesties that facilitate societal reintegration (Zena, 2013, pp. 5–6). However, the decisional matrix regarding enrolment in disarmament initiatives cannot be reduced to purely individuated factors. This is because armed groups frequently operate in a collectivist fashion marked by militarised, hierarchical organisational structures. Evidence suggests that this institutional schema exerts influence on disarmament choices (Theidon, 2007, p. 87). Specifically, the communal military ethos impels ex-combatants to continue acting as relatively homogeneous blocs that internalise the dialectical cadet–commander relationship, with obedience and loyalty enduring post-conflict. Hence, military leaders can mobilise entire units either towards disarmament or, alternatively, continued bellicosity through mass rejection of negotiated settlements, as observed when particular Bougainville commanders retained forces and weaponry while swaying their communities to abrogate the peace pact and persist with hostilities (Starygin, 2013, p. 70).

Instances of ex-combatants abstaining from disarmament therefore necessitate examination of the multi-layered factors underpinning this decision, spanning the individual, group, and the broader socio-political and economic context enveloping both ex-combatant and post-conflict society as a whole. This analysis finds concrete embodiment within the model presented in this paper through the inclusion of interrogatives probing the potential rejection of negotiated peace agreements.

Such repudiation by a subset of ex-combatants proves relatively commonplace throughout peace processes, explicable by reference to internal tensions frequently plaguing armed groups. These clearly manifest themselves in pronounced political cleavages or more subtly via internecine competition across fighter factions (Wood and Kathman, 2015, pp. 176–177). Consequently, group social dynamics can profoundly catalyse the rejection of accords, or even entire processes, by leaders justifiably fearing considerable erosion of hard-fought influence and power through well-documented mechanisms of coercion resistance (Stedman, 1997, pp. 52–53). That said, beyond outright rejection, individual-level motives also offer explanatory power regarding nonparticipation in post-conflict disarmament and demobilisation in the absence of prolonged fighting while still retaining

personal armaments. Thus, meticulous and unbiased scrutiny of the multifaceted identity and subjectivity of ex-combatants throughout disarmament represents a critical research imperative. Existing scholarship has provided provisional insights illuminating related factors, like gender identity and sexual orientation (Hagen, 2016, pp. 1–2), as well as the outsized impact implementation modalities can exert on the success or failure of peace processes (Joshi *et al.*, 2017, p. 20). Nevertheless, considerable scope remains to advance knowledge regarding the complex interplay between individual combatant psyches and broader social contexts.

The presented model posits that abstaining from disarmament initiatives while concurrently repudiating the negotiated peace agreement engenders conflict continuation. However, this bellicosity reveals itself in distinct characteristics from the preceding fighting, instead assuming more subtle forms marked by significant yet opaque opposition and, critically, retention of arms rendering power balances uncertain. Indeed, overt violence is not the definitive outcome, but rather sustained confrontation remains an integral output of the model's equation. This stems from the model's core assumption that avoiding disarmament while rejecting conflict settlement preserves weaponry capabilities and signals motivations regarding the peace process. Thus, the stage is set for renewed strife, even if not manifested in outright warfare. Of course, the precise pathway to conflict continuation remains contextually contingent and merits further research to complement the model's theoretical framework. For instance, do all ex-combatants receiving amnesty equally contribute to conflict continuation despite refusing to disarm? How do their motivations and identities intersect with weapon retention decisions?

Our model incorporates a non-normalising binary option into the query for rejecting the peace agreement in the form of "not necessarily." This choice can be explained by the complex apprehension of political behaviour during the disarmament phase. Indeed, understanding why an ex-combatant would not participate in a disarmament process when he does not reject the peace agreement is complicated, even assuming that he formally accepts the latter with the total cessation of fighting and hostilities. A large number of studies have shed light on the political and social behaviour of ex-combatants within and outside of disarmament processes (Knight and Özerdem, 2004).

The behavioural model of ex-combatants confronting post-conflict disarmament presented herein proposes an individualistic, security-driven explanation for this highly unique scenario. The Bougainville case demonstrates that two "dissident" ex-combatant categories emerged subsequent to the peace agreement at timepoint $t + 1$. One cohort perpetuated hostilities whereas another retained weapons without ongoing violence, therefore stockpiling but not actively utilising arms. The proposed model (Figure 3) depicts the latter behaviour, illustrating for this particular post-conflict disarmament situation substantial individualism intertwined with collective dynamics amenable to conceptualisation as a security dilemma.

This foundational international relations construct has seen prolific application in the literature investigating global and ethnic conflicts for decades (Tang, 2011). The crux of this dilemma within the proposed framework is that ex-combatants' ambient environment influences individual decisions regarding whether to relinquish weapons, to retain them for potential self-defence, or to persist with hostilities. However, this individualistic logic engenders a recursive loop through heightened threat perceptions stemming from the understandable assumption that other ex-combatants find themselves entertaining similar security-driven deliberations. In essence, attempts to enhance one's own security foster collective insecurity. Elucidating the precise causal mechanisms and relative strengths of

Figure 4. Individual disarmament security dilemma.
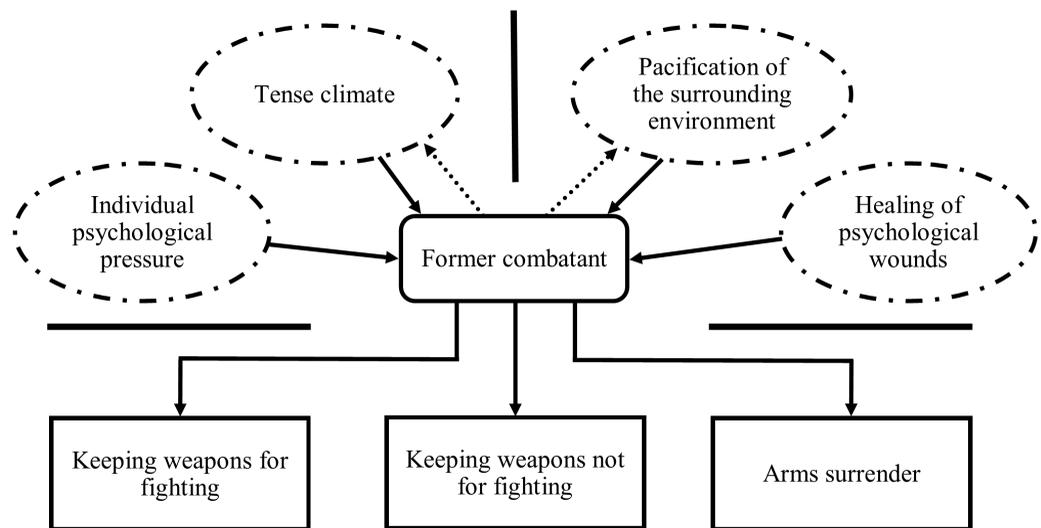
environmental versus individual factors in this recursive process remains imperative for both theoretical refinement and informed policy interventions.

This behaviour associated with a security dilemma manifests itself through distinct perceptions capable of catalysing either conflict relapse per a conventional security dilemma, or alternatively, productive advancement on disarmament. This concept of the security dilemma has been encapsulated in an embedded sub-model revolving around the individual (Figure 4).

Ex-combatants confronting disarmament decisions face an environmental milieu exerting manifold influences, alongside their intrinsic psychological states. While the environment shapes individual behaviour in infinitesimally complex ways, the proposed model adopts a simplified binary conceptualisation of these exogenous effects as either positive or negative regarding disarmament processes. Considerable work remains to be explored regarding this construct's specifics. Conversely, the notion of psychological influence, ex-combatants' personal recollections and feelings about their wartime ordeals, has garnered greater research attention (McKenzie-Mohr and Dyal, 1991). Though such inward disposition assuredly affects choices, sociocultural, economic, and political factors also substantially influence individual and group decisions in post-conflict settings. Hence, ex-combatants may encounter competing logics, which the proposed model again binarises into positive or negative disarmament inclinations.

Importantly, this sub-model (Figure 4) also delineates the security dilemma's recursive nature, whereby individuals shape their environment, indirectly influencing other ex-combatants' perceptions and responses in an endless loop. This collective dynamic introduces potential for either heightened tensions and conflict relapse, or alternatively, a virtuous circle where diminished threat perceptions spur further disarmament. The dilemma's essence is this double-edged nature, capable of swaying ex-combatants across the disarmament spectrum through communal processes, despite the initial individualistic perspective. Further research into both specific environmental and psychological factors, as well as their relative contributions to post-conflict decisions, is critical. For instance, do ex-combatants privilege environmental stimuli over personal psychology, or vice versa? Overall, this framework highlights the multifaceted drivers of weapon relinquishment.

The security dilemma sub-model yields identical outcome options as the overarching framework, underscoring three non-static endpoints subject to evolution per political and social forces.

The first hypothetical outcome entails weapon retention to continue fighting. This appears intuitively probable, as psychological and environmental pressures stemming from other ex-combatants' actions may compel individual belligerence, stymieing disarmament and engendering continuation of hostility. The literature commonly labels such actors "spoilers of the peace." This outcome proves highly detrimental for disarmament, as de-escalation becomes increasingly challenging once caught in a recursive escalation cycle as envisaged here (Janssen and van de Vliet, 1996). Specifically, subjective threat perceptions prompt minor aggressions, eliciting reactions which reify initial threats in a self-fulfilling spiral absent concerted external intervention.

Just as a self-reinforcing cycle of escalation can emerge within the dynamics of this security dilemma framework, an alternative "virtuous circle" outcome remains plausible that could advance the progressive disarmament process. We may observe a chain of interpersonal influence pushing ex-combatants towards the incremental surrendering of arms. This type of progressive behavioural pattern aligns with the theories of recursive persuasion discussed earlier. Such a virtuous cycle could largely stem from authorities directing post-conflict disarmament operations, with their actions serving to stimulate beneficial group dynamics.

However, beyond these two potential trajectories, a third outcome may arise, wherein the disarmament process stalls without a full or even partial resumption of hostilities. This alternative pathway involves ex-combatants retaining their weapons while abstaining from further violence. This peculiar dynamic breeds substantial distrust at both individual and potentially intergroup levels as well as toward post-conflict governing institutions and other ex-combatants due to lack of faith in the representativeness of weapons and security guarantees. Weapons also take on symbolic meanings of power and protection that reinforce these evolving threat perceptions (Feldmann and Johnson, 1992, pp. 568–572). This attitude towards the object and the security it can bring is therefore found in our loop, pushing everyone to act in this way in order to protect themselves from external dangers, on the basis of a perceived or real danger that is based on personal and collective experience as well as on historical facts. Consequently, disrupting this self-sustaining pattern without reigniting tensions or sparking renewed conflict appears quite difficult without rebuilding faith in new democratic structures and establishing compelling incentives for relinquishing arms while concurrently enhancing perceptions of safety. To initiate disarmament among individuals caught in this self-perpetuating cycle, priorities must include cultivating institutional legitimacy while crafting beneficial terms for surrender alongside regional trust-building initiatives.

This third dynamic often typified the situation of the "latecomers" in the Bougainville conflict, as manifested through various impediments requiring time, resources, and improving confidence to eventually surmount them. Political pressures, delayed peace efforts, and enhancements to the socio-political climate facilitated disruption of certain security dilemma mechanics outlined theoretically.

Returning to the overarching model, it posits the same three potential outcomes as the framing of the security dilemma. The existence of stress in the model is contingent upon this dilemma. We recognise how perceived or actual threats of renewed confrontation can lead to either weapons relinquishment or retention according to security dilemma logic. In the short term, the most probable options are to be found around arms conservation,

significantly influenced by the temporal variable. Indeed, time constitutes a core element in disarmament implementation, with delaying tactics representing a pivotal strategy (Shubik, 1968, p. 100). Prolonged periods allow the gradual dissipation of personal and collective suspicions through developing trust in state or authority assurances. This study thus considers the temporal variable indispensable, as it also subsumes environmental and psychological hazards that broadly affect security dilemma dynamics as modelled. Sustained peace-building mandates addressing such issues to circumvent equilibrium traps threatening pathways to more constructive resolution.

One of the principal uncertainties in our model pertains to characterising the position of ex-combatants who opt to retain weapons without a present intent to employ them in violence. This stance appears to represent a temporary status awaiting evolution, allowing its characterisation as a type of "just-in-time" calculus. It proves difficult to discern precisely what factors may prompt ex-combatants to either resume hostilities or embark upon the path of comprehensive disarmament. However, understanding the contextual nuances, particularly through establishing robust dialogue, can help illuminate some of the intricacies involved in this process and the situation-specific nature of outcomes. While the iterated security dilemma framework partially explains emergent group dynamics among individuals, pinpointing the true causal mechanisms behind escalation or de-escalation remains challenging. This uncertainty represents a core focus of peace and conflict research aimed at conflict resolution (Rubin *et al.*, 1994). Continuous model refinement and empirical testing can enhance comprehension of this ambiguous transition phase to either sustain ceasefires or enable comprehensive settlement.

This intermediate stance appears to represent a temporary calculus evolving in relation to varying stress levels, influenced significantly by environmental conditions and memories of past conflict. Such stresses may also manifest through the approach taken to reintegrate ex-combatants and the opportunities afforded through disarmament, demobilisation, and reintegration (DDR) programmes. For instance, neglecting ex-combatants' aspirations and disinterest in addressing their political ambitions could exacerbate stress, potentially triggering renewed hostilities (Bevan, 2008, pp. 54–55). In the case of Bougainville, consideration of the objectives and political aims of ex-combatants linked to initial conflict drivers allowed for a more peaceful political transition than may have resulted without establishing transitional political frameworks (Braithwaite *et al.*, 2010, pp. 56–58). Comprehensive DDR mandates that recognizing ex-combatants' grievances can help relieve destabilising pressures during fragile ceasefires. Regular evaluation of programme efficacy remains crucial for modifying approaches as necessary to optimise conditions supporting enduring settlements over a return to violence.

Stress therefore seems to be the central variable of those we have called "latecomers" in terms of disarmament processes. We understand stress as a variable directly related to the security dilemma and placing the individual in a reflection, both individually and collectively, in which his perceptions are influenced by the environment and his own personal constructs, which may lead the individual to act in one way or another, depending on his beliefs and personal sense of risk. This stress can evolve positively or negatively in our general model, which leads to either continuity in the conservation of weapons, but with a conflicting aim, or progressive engagement in the path of disarmament. One thing is certain, again, in terms of disarmament, time plays an important role, while conflict engagement may be much more brutal.

This preliminary framework outlines the theoretical understanding of ex-combatant decision-making regarding post-conflict disarmament presented in this paper. However, this research acknowledges certain limitations that signify opportunities for deeper

examination. Shedding more light on contextual influences, temporal factors, and socio-political considerations left relatively underexplored could strengthen the model and catalyse new insights. Addressing pending questions surrounding these dynamics remains an area ripe for continued research aimed at refining and applying this perspective.

Structural and Functional Limits of the General Model

Attempting to model the complex behaviour of individuals and groups presents inherent methodological challenges that must be acknowledged (Song *et al.*, 2010, p. 1021). Clearly elucidating the boundaries and limitations of any theoretical framework allows for its appropriate application while facilitating ongoing improvements as new empirical evidence emerges over time. As detailed in the preceding section, certain assumptions placed constraints on the current model's scope and predictive capacities. For instance, while the lack of a formal peace agreement does not definitively indicate continued armed hostilities will ensue, some de-escalation of tensions can still unfold without a signed accord due to informal negotiation processes (Beer *et al.*, 1995, pp. 306–308).

Relatedly, rejection of a peace deal alone does not necessarily precipitate sustained conflict if ceasefire arrangements hold among former adversaries. Rivalries in post-conflict settings tend to manifest themselves through non-military competitive dynamics as well, such as via political contests over territorial authority and governance (Joshi and Quinn, 2017). The proposed security dilemma construct also faces limitations, as precisely defining causal influence mechanisms between contextual stressors and ex-combatant behaviours remains empirically challenging, though these are active areas of ongoing research. Conceptual and methodological refinements will be needed to further elucidate relationship structures within this theoretical framing.

The current model is limited, as it simplifies complex, real-world dynamics into dichotomous categories of stressors, representing an oversimplification that warrants further decomposition into more nuanced and granular variables. Similarly, aggregating the multidimensional influences of environmental and psychological factors into unitary independent variables overlooks considerations of dimensionality and intersectionality that probably affect outcomes. As the model was primarily informed by insights from the Bougainville case study, applying it to analyse different post-conflict settings will almost certainly necessitate recalibration of variable weights and structural relationships to better fit new contextual realities. Nonetheless, the model provides a conceptual starting point and foundation that can be adapted and built upon when examining disarmament processes across diverse contexts. Finally, while participation in disarmament programmes can influence individual choices, it is an acknowledgment that programme involvement alone does not guarantee that disarmament will be successfully achieved at the individual level due to myriad potential intervening factors (Rufer, 2005, pp. 24–25).

Beyond issues of variable specification, the model's theoretical framing poses inherent philosophical constraints that must be acknowledged. By conceptualising the security dilemma as primarily affecting individuals, the model does not fully capture reality's irreducibly intersubjective nature, with identities and meanings intricately interwoven within social relations not easily separable into discrete "environments" and "individuals." Conceptualising identity as fragmented rather than coherent risks reifying artificial dichotomies. Holistic perspectives drawing on indigenous epistemologies may offer alternative promising avenues for model development. For instance, conceptualising disarmament

through the lens of sacred revitalisation could better align with Bougainvillean traditions that value unity, reciprocity, and ancestral wisdom in social relations (Braithwaite *et al.*, 2010). More broadly, quantitatively modelling extraordinarily complex human behaviour will necessarily entail limitations. While simplifying assumptions confer analytical traction, comprehensively grappling with pluralities of experience and competing ontologies remains paramount for meaningful knowledge advancement. Exploring the boundaries and constraints of theoretical frameworks expands modelling possibilities and deepens understanding of phenomena, such as disarmament and peace-building.

Conclusion

This study aimed to theoretically conceptualise a model of ex-combatant decision-making dynamics during post-conflict disarmament processes by drawing upon insights from the phenomenon of "latecomer" disarmament seen in the example of Bougainville. The proposed "latecomer security dilemma" framework posits that weapons retention by ex-combatants initially stems from contextual stressors and the temporal factor, but this interim stance of retaining arms without violence will eventually transition either toward renewed armed hostilities or protracted, challenging disarmament engagement. Implementing comprehensive disarmament amidst the uncertainties generated by this dilemma exposes the inherent complexities of defining process timelines and determining when completion can definitively be considered achieved. Parallels may be drawn to the challenges of nuclear disarmament, where structural obstacles within verification protocols and institutions tend to breed "disarmament disillusionment" regarding certainty of outcomes (Ritchie, 2019). A comparable dialectic applies to the implementation of formal DDR programmes at local levels, although situated dynamics supersede general structural factors. Nonetheless, thoughtful consideration of psychological and behavioural dilemmas remains crucially important for planning small arms disarmament initiatives, especially given recent scholarly focus on the indispensable roles of social imaginaries, identities, and intersubjective meanings within peace-building endeavours (Bolton, 2020). The Bougainville case provides a vivid example of such intricacies, with post-agreement clashes potentially intertwined with more ephemeral dimensions beyond mere physical weapons relinquishment (Forsyth, 2019).

However, an overreliance on technical modelling approaches also risks overlooking meaningful consideration of alternative ontological perspectives predominant within local contexts. For instance, Bougainvillean social traditions emphasise holistic conceptualisations of relationships and spirituality, rather than bifurcated understandings that separate individuals from their environments (Braithwaite *et al.*, 2010). Centring indigenous epistemologies in model conceptualisation could help avoid artificially reifying false dichotomies by better accounting for pluralistic worldviews. This study demonstrates the inherent and enduring uncertainties surrounding timelines for disarmament in post-conflict settings. While quantitative modelling provides analytical leverage, further advancing understandings demands grappling with the multifaceted complexity of social realities. Deeper interrogation of ex-combatant decision-making behaviours and the dilemmas they face during transition could serve to nuance disarmament theory and inform more contextually sensitive policy approaches. Ultimately, locating quantitative frameworks within their applicable cosmologies while elucidating intrinsic constraints allows for productive application alongside opening up new conceptual possibilities. Comprehensive disarmament processes ultimately require contending with issues of multiplicity, humanity, and interpretive meaning on local lived experiences of peace-building.

References

Aghedo, I. (2013) 'Winning the war, losing the peace: Amnesty and the challenges of post-conflict peace-building in the Niger Delta, Nigeria', *Journal of Asian and African Studies,* 48(3), pp. 267–280. doi: 10.1177/0021909612453987.

Beer, F., Sinclair, G., Healy, A. and Bourne, L. (1995) 'Peace agreement, intractable conflict, escalation trajectory: A psychological laboratory experiment', *International Studies Quarterly,* 39(3), pp. 297–312. doi: 10.2307/2600922.

Bevan, J. (2008) 'Crisis in Karamoja: Armed violence and the failure of disarmament in Uganda's most deprived region', *Small Arms Survey,* 21(1).

Boege, V. and Rinck, P. (2019) 'The local/international interface in peace-building: Experiences from Bougainville and Sierra Leone', *International Peacekeeping,* 26(2), pp. 216–239. doi: 10.1080/13533312.2018.1561185.

Bolton, M. (2020). *Imagining disarmament, enchanting international relations.* Berlin, Springer. doi: 10.1007/978-3-030-17716-4.

Boshoff, H. (2007) 'Demobilisation, disarmament and reintegration in the democratic Republic of Congo: A never-ending story', *African Security Review*, 16(2), pp. 59–62. doi: 10.1080/10246029.2007.9627417.

Braithwaite, J., Charlesworth, H., Reddy, P. and Dunn, L. (2010) *Reconciliation and architectures of commitment: Sequencing peace in Bougainville.* Canberra ACT, The Australian National University Press. doi: 10.22459/RAC.09.2010.

Breen, B. (2016) *The Good Neighbour: Australian Peace Support Operations in the Pacific Islands 1980–2006.* Cambridge: Cambridge University Press, 2016. doi: 10.1017/CBO9781139196390.

Cardenas, J., Pérez, N. and Triana, S. (2016) 'Different paths to peace building: A comparative analysis of DDR programs in Colombia and the Province of Aceh, Indonesia', in Cardenas, J., Pérez, N. and Triana, S. (eds.) *Handbook of research on transitional justice and peace building in turbulent regions.* Hershey, PA: IGI Global, pp. 374–396. doi: 10.4018/978-1-4666-9675-4.ch019.

Cochrane, G. (2017) *Anthropology in the mining industry: Community relations after Bougainville's civil war.* Berlin: Springer.

Feldmann, T. and Johnson, P. (1992) 'The selfobject function of weapons: A self-psychology examination', *Journal of the American Academy of Psychoanalysis,* 20(4), pp. 561–576. doi: 10.1521/jaap.1.1992.20.4.561.

Forsyth, M. (2019) 'Kill all the sorcerers: The interconnections between sorcery, violence, war and peace in Bougainville', *The British Journal of Criminology,* 59(4), pp. 842–861. doi: 10.1093/bjc/azy047.

Hagen, J. (2016) *Did sexual orientation and gender identity play a role in the rejection of the Colombian peace deal?* Women, Peace and Security. Available at: https://eprints.lse.ac.uk/76859/ (Accessed: 1 September 2023).

Janssen, O. and van de Vliet, E. (1996) 'Concern for the other's goals: Key to (de-)escalation of conflict', *International Journal of Conflict Management,* 7(2), pp. 99–120. doi: 10.1108/eb022777.

Joshi, M., Melander, E. and Quinn, J. (2017) 'Sequencing the peace: How the order of peace agreement implementation can reduce the destabilizing effects of post-accord elections', *Journal of Conflict Resolution,* 61(1), pp. 4–28. doi: 10.1177/0022002715576573.

Joshi, M. and Quinn, J. (2017) 'Implementing the peace: The aggregate implementation of comprehensive peace agreements and peace duration after intrastate armed conflict', *British Journal of Political Science,* 47(4), pp. 869–892. doi: 10.1017/S0007123415000381.

Knight, M. and Özerdem, A. (2004) 'Guns, camps and cash: disarmament, demobilization and reinsertion of former combatants in transitions from war to peace', *Journal of Peace Research,* 41(4), 499–516. doi: 10.1177/0022343304044479.

Mansoob Murshed, S. (2009) 'Revisiting the greed and grievance explanations for violent internal conflict', *Journal of International Development*, 21(1), pp. 87–111. doi: 10.1002/jid.1478.

McKenna, K. (2019) *Status and implementation of the Bougainville Peace Agreement and implications for referendum.* Port Moresby, The National Research Institute of Papua New Guinea.

McKenzie-Mohr, D. and Dyal, J. (1991) 'Perceptions of threat, tactical efficacy and competing threats as determinants of pro-disarmament behavior', *Journal of Social Behavior and Personality,* 6(4), pp. 675-696.

Moore, A. (2017) 'Strategic planning for durable peace: The role of effective disarmament, demobilization, and reintegration of ex-combatants as part of the process, and lessons to be learned from MDRP and TDRP in the Great Lakes Region', in *International conference on peace, security and social enterprise,* Nairobi, The University of the West of Scotland.

Muggah, R. (2005) 'No magic bullet: A critical perspective on disarmament, demobilization and reintegration (DDR) and weapons reduction in post-conflict contexts', *The Round Table: The Commonwealth Journal of International Affairs,* 94(379), pp. 239–252. doi: 10.1080/00358530500082684.

Muggah, R. (2006) 'Emerging from the shadow of war: A critical perspective on DDR and weapons reduction in the post-conflict period', *Contemporary Security Policy,* 27(1), pp. 190–205. doi: 10.1080/13523260600603493.

Paes, W.-C. (2005) 'The challenges of disarmament, demobilization and reintegration in Liberia', *International Peacekeeping,* 12(2), pp. 253–261. doi: 10.1080/13533310500066537.

Regan, A. (2002) 'The Bougainville political settlement and the prospects for sustainable peace', *Pacific Economic Bulletin,* 12(1), pp. 114–128.

Renner, M. (1997) *Small arms, big impact: The next challenge of disarmament.* Collingdale, PA: DIANE Publishing.

Ritchie, N. (2019) 'Inventing nuclear disarmament', *Critical Studies on Security,* 7(1), pp. 73–77. doi: 10.1080/21624887.2018.1468083.

Rubin, J., Pruitt, D. and Kim, S. (1994) *Social conflict: Escalation, stalemate, and settlement.* New York, NY: Mcgraw-Hill.

Rufer, R. (2005) *Disarmament, demobilisation and reintegration (DDR): Conceptual approaches, specific settings, practical experiences.* Geneva: Geneva Centre for the Democratic Control of Armed Forces (DCAF).

Shubik, M. (1968) 'On the study of disarmament and escalation', *Journal of Conflict Resolution,* 12(1), pp. 83–101. doi: 10.1177/002200276801200107.

Song, C., Qu, Z., Blumm, N. and Barabási, A.-L. (2010) 'Limits of predictability in human mobility', *Science,* 327(5968), pp. 1018–1021. doi: 10.1126/science.1177170.

Spark, N. and Bailey, J. (2005) 'Disarmament in Bougainville: Guns in boxes', *International Peacekeeping,* 12(4), pp. 599–608. doi: 10.1080/13533310500202025.

Starygin, S. (2013) 'The gangs of Bougainville: Seven men, guns and a copper mine', *Journal of Conflict Transformation & Security,* 3(1), pp. 55–76.

Stedman, S. (1997) 'Spoiler problems in peace processes', *International Security,* 22(2), pp. 5–53. doi: 10.1162/isec.22.2.5.

Tang, S. (2011) 'The security dilemma and ethnic conflict: Toward a dynamic and integrative theory of ethnic conflict', *Review of International Studies,* 37(2), pp. 511–536. doi: 10.1017/S0260210510000616.

Tankunani Sirivi, J. and Taleo Havini, M. (2004) *As mothers of the land: The birth of the Bougainville women for peace and freedom.* Canberra ACT: ANU Pacific Institute.

Theidon, K. (2007) 'Transitional subjects: The disarmament, demobilization and reintegration of former combatants in Colombia', *International Journal of Transitional Justice,* 1(1), pp. 66–90. doi: 10.1093/ijtj/ijm011.

Wallis, J. (2012) 'Ten years of peace: Assessing Bougainville's progress and prospects', *The Round Table: The Commonwealth Journal of International Affairs,* 101(1), pp. 29–40. doi: 10.1080/00358533.2012.656028.

Wallis, J. (2019) 'The role of 'uncivil' society in transitional justice: Evidence from Bougainville and Timor-Leste', *Global Change, Peace & Security,* 31(2), pp. 159–179. doi: 10.1080/14781158.2019.1585795.

Wood, R. and Kathman, J. (2015) 'Competing for the Crown: Inter-rebel competition and civilian targeting in civil war', *Political Research Quarterly,* 68(1), pp. 167–179. doi: 10.1177/1065912914563546.

Zena, P. (2013) *The Lessons and limits of DDR in Africa.* Washington, DC: Africa Center for Strategic Studies.