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Evaluate the Potential Effectiveness of Air Power in Sub-threshold and 'Grey Zone' Operations

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Biography: Wing Commander Clare Mummery joined the Royal Air Force in 2008 as an Aerosystems Engineer. She's since carried out tours on and in support of multiple aircraft types, including fast jets, transport aircraft and support helicopters, with two deployments on Operation Herrick in Afghanistan. Following OF3 Command, as XO Air Wing Engineering at RAF Brize Norton, she was promoted to Wing Commander in 2021 and attended the Advanced Command and Staff Course, during which she wrote the following Defence Research Paper.

Abstract: Conflict in the grey zone has ever been part of geo-political rivalry, but despite this, hasn't until recently been given adequate consideration. This paper expands the narrative on the effective use of air power in the grey zone through a literature review and two cases studies of Iran and Japan. At the strategic level it concludes there is an important role for air power in the grey zone, both in support of deterrence by punishment and deterrence by denial strategies. However, the nature of grey zone conflict leads to several fundamental requirements for effective use of air power. Namely strategic patience, a finely tuned risk calculus and integration within a holistic cost imposing strategy.

Disclaimer: The views expressed are those of the authors concerned, not necessarily the MOD.

Section 1 Introduction

In a 2019 RAND study, notable political scientists stated:

The United States is entering a period of intensifying strategic competition with several rivals, most notably Russia and China. U.S. officials expect this competition to be played out primarily below the threshold of armed conflict, in what is sometimes termed the gray zone between peace and war.¹

As identified within the statement, sub-threshold and 'grey zone' operations are one and the same. They are operations which intentionally 'remain below thresholds that would generate powerful... response, but nonetheless are forceful and deliberate, calculated to gain measurable traction over time.'² The central aims of grey zone strategies are often the same, with revisionist powers seeking to undermine the international order and gain greater control over spheres of influence.³ However core features of this competition vary between aggressors.

'Russian gray zone campaigns in Europe...consist primarily of disinformation campaigns meant to undermine political institutions. Other Russian gray zone tactics include the use of economic tools to extract concessions or hold countries at risk of being coerced through an over-reliance on Russian energy; the demonstration of military threats through exercises near the borders of certain states; and...the infiltration of Russian security forces to exert de facto control over disputed territory.'⁴

While Chinese grey zone tactics focus on deterrence or denial of resources through use of law enforcement and maritime militia, and expansion and militarisation of artificial islands to further tilt the regional balance in China's favour. In addition, to support these tactics, China employs broad economic coercion and political subversion including diplomatic pressure, legal warfare, disinformation campaigns and cyberattacks.^{5,6}

As argued by Michael Eisenstadt, the rise of actors who see conflict as a continuum, while the West has been constrained by binary thinking of peace or 'all-out' war, has allowed space and opportunity for actors such as China and Russia to exploit the grey zone.⁷ This was highlighted by the UK Secretary of State for Defence, Ben Wallace, in 2020 when he said 'Our values and interests are being challenged in the grey zone all over the world.'⁸ Western nations and defence communities are now waking up to the realisation they are inadequately prepared to counter grey zone conflict. As stated by Morris et al, '[The] United States and its allies... have yet to come to terms with the challenge of the [grey zone] threat, let alone fashion a strategy to neutralize or roll it back.'⁹

This dawning realisation has led to an increased narrative and analysis of grey zone conflict. However, this has been predominantly focused on non-military tactics including Russia's cyber and disinformation campaigns, and China's fait accomplis and 'whole-force' use of fishermen

and the Coast Guard to deter and deny access to resources.¹⁰ Less focus has been given to the use of conventional military forces in the grey zone and particularly on the use of air power. With China's increasing use of air power in the South China Sea, as evidenced by the recent deployment of 16 aircraft from the People's Liberation Army Air Force (PLAAF) near Malaysian airspace, there is increasing debate over whether this is a new tactic for China to assert its claims.¹¹ In addition, increasing PLAAF incursions into Japanese and Taiwanese Air Defence Identification Zone,¹² and expansion in the use of drones in grey zone conflict by Russia, China and Iran,¹³ highlights the relevance of further study. This paper aims to provide greater thinking and expand the narrative on the utility of air power in the grey zone, both as an offensive grey zone component and as an effective strategic countermeasure.

The core thesis of this paper is that air power has significant utility across a range of grey zone operations, due to its ability to effectively support both a strategy of deterrence by punishment and deterrence by denial. However, effective application relies on a number of key factors. Firstly, a need for strategic patience and recognition that gains will be gradual over extended timeframes, likely appearing more as a maintenance of the status quo. Secondly, that the risk of escalation from the use of military force, combined with the need to signal commitment and intent, requires a finely tuned risk calculus. However, the non-binary nature of the grey zone supports nuanced, incremental objectives and a greater risk tolerance than the West currently employ in the grey zone. Thirdly that, as grey zone aggressors have adopted highly sophisticated, holistic grey zone strategies where many elements cannot be targeted by air power, successful strategies to counter grey zone aggression must rely on an equally comprehensive approach. However, these strategies must retain a focus on legitimacy and proportionality to support the objective of undermining the reputation and support for grey zone aggressors.

To explore this thesis, the paper will first undertake a literature review of the debate on the use of military force in the grey zone, identifying three key themes for the effective use of air power. It will then move on to two case study reviews structured around those three key themes. The first case study of Iran will focus on the effectiveness of an offensive use of air power as part of a strategy of deterrence by punishment. The second Japan case study focusses on the effectiveness of air power as part of strategy of deterrence by denial, to prevent fait accompli. These case studies will allow conclusions to be drawn on the effective use of air power across both strategies, providing insight in to how the West can better integrate air power into an effective grey zone strategy.

Section 2

Literature Review

The title of this paper potentially covers a very wide scope, with the grey zone spanning political, diplomatic, informational, social, economic and military activity, often synchronised and integrated.¹⁴ To gain sufficient focus on the effective use of air power in the grey zone, this review does not outline the debate on the origins of the grey zone concept, nor does it focus

on the debate around its characteristics or definition. For insight into these areas, works such as Michael Mazarr's *Mastering the Gray Zone*,¹⁵ Javier Jordan's article 'International Competition Below the Threshold of War'¹⁶ or Jahara Matisek's *Shades of Gray Deterrence*¹⁷ offer comprehensive insight. Instead, this review focusses on scholarship on the effectiveness of military force in the grey zone. It has been elected to keep the literature review at the level of military effectiveness, rather than contracting further to air power only, to avoid a loss of sufficient breadth and number of texts for review and to avoid an overly tactical analysis. In undertaking this review, three themes on the effective use of military force in grey zone operations have been identified. Namely short-termism and the idea of victory, elevated risk and risk tolerance, and holistic cost-imposing strategies. These three key themes will provide the framework for the rest of the paper.

Short-termism and the idea of victory

The first theme for review is political or policy maker short-termism prejudicing the effectiveness of grey zone strategies. This can be compounded by a failure to recognise the different nature of victory in the grey zone, contributing to difficulty in measuring attainment of objectives and frustration from perceived or real lack of progress. Mazarr and Jordan highlight the challenge that persistent and gradual grey zone activity poses to effective Western military response.¹⁸ Grey zone activities occur in the order of decades, or as described in the US National Defense Strategy, in an enduring competition continuum.¹⁹ But Western militaries, in particular, are reliant on the approval of politicians, with a focus on the immediate and short-term, dictated by election calendars to the detriment of support for long-term commitments.²⁰ Mazarr also describes how grey zone campaigns are likely to play out: 'generating occasionally clear advances, frequent reversals, and no final objective outcomes.'²¹ Further highlighting the challenge this will pose for Western states 'more comfortable with simple, traditional conflicts with well-defined objectives, a defined time frame, and a clear winner.'²² Votel et al outline the notion of winning, stating 'a gray zone "win" is not a win in the classical sense. Winning is perhaps better described as maintaining the US Government's positional advantage, namely the ability to influence partners, populations, and threats towards achievement of our regional or strategic objectives.'²³ Matisek goes further suggesting grey zone conflicts are a 'catch-22', stating 'Trying to robustly "win" in the near term against gray zone actors is not only infeasible but also undermines prospects of "winning" the conflict over the long-term... [but] Playing the long game is equally frustrating for domestic audiences (and politicians).'²⁴

This review has highlighted strong consensus on the extended and flexible timeframe associated with a grey zone win, which is characterised by incremental gains that look more like a maintenance of the status-quo rather than a notable victory. There is also consensus on the challenge this poses to Western militaries in particular. For military effectiveness, politicians, supporting departments, partners and allies will need to exercise strategic patience to avoid miscalculation and counter-productive heavy handedness when competing priorities apply pressure to grey zone strategies.

Elevated Risk and Risk Tolerance

The second theme in the literature review is elevated risk and risk tolerance in military grey zone strategies, fundamental to the debate over what extent the military should be engaged in grey zone activity. There is a view that, of the levers of power that can be wielded in the grey zone, military ones have the greatest risk of miscalculation and escalation, and of being counterproductive.²⁵ Mazarr argues that grey zone strategies increase risk of conflict by their ambiguous nature and risk taking. That their very success depends on remaining below key thresholds, but as these thresholds are rarely clearly articulated, there is an increased risk of inadvertent war if key thresholds are crossed and are of unexpected vital interest.²⁶ Jordan outlines the direct, limited and sporadic use of force as the highest level of escalation in a grey zone conflict and often a pre-war situation.²⁷

In addition to the elevated risk of military activity in the grey zone, theorists also argue that the use of military force in the grey zone can be counterproductive. Matisek outlines how the ambiguity of grey zone activity blurs the lines of sovereignty and law, leading to issues with legality of military response.²⁸ Mazarr also highlights how use of military force in such situations can undermine legitimacy, cause backlash over perceptions of heavy-handedness if pursued too aggressively and support the aims of the aggressor.²⁹ As Johnson argues with reference to actors such as Russia, those who 'subvert international norms and use force, forfeits... international status and the protection of peacetime norms.'³⁰ So the same applies to the US and allies in the use of military force in the grey zone. Matisek expands on this by stating 'This normative expectation [from US hegemony] undercuts the United States ability to engage in gray zone activities, as it is much easier for various actors to highlight some United States actions as hypocritical... to Western values.'³¹

Risk Tolerance

This selection of views offers some academic consensus that the use of military force in the grey zone comes with greater risk of miscalculation, escalation and counter-productivity. However, the avoidance of its use may signal limited interest. As stated by Bothwell, 'signalling is necessary to communicate specific red lines over vital interests through credible commitments, such as sunk costs.'³² Takahashi goes further, claiming there is an inherent need to 'develop a robust posture to win the possible war in the case of escalation, and to make the challengers recognise the possibility of unfavourable military conflict.'³³ Taken together, this implies that the use of military force may not always be appropriate and requires careful consideration in its application, but failure to integrate its use as part of a strategy of deterrence may be seen as an indication of limited commitment and encourage further aggression.

Noting these arguments of miscalculation, escalation and counter-productivity, it is unsurprising then that opinion is split over the effectiveness of military involvement in grey zone conflict. Arguments range from military involvement as part of a conventional deterrence strategy only, moving to limited use as secondary to other levers of power, and

finally an argument that military power should play a significant role in the grey zone as interconnectedness now prevents effective use of other levers in the grey zone. The following paragraphs will outline each of these arguments.

The Three Opinions on use of Military Force

A number of scholars argue that risks and limited effect mean military force should not be used in grey zone strategies, instead retaining a focus on conventional deterrence. Monahan outlines that 'gray zone aggression seeks to degrade and subvert existing rules to change the very paradigm of the competition.'³⁴ He argues that normalisation of grey zone tactics favours aggressors such as Russia and China, undermining Western competitive advantage which lies in upholding the rules-based international order. He further expands to state that 'Tit-for-tat responses offer minor returns and exposure to downside risk.'³⁵ Monahan's view is supported by Mitre and Gellerman who claim with reference to the US, 'The Department of Defense's primary role in great power competition should be to deter war, not engage in daily competition.'³⁶ Further arguing that 'The risks of not doing so are the militarization of foreign policy, potential escalation of competition, and distraction from deterrence.'³⁷

Moving to the second opinion, there is support for an argument that military responses should be utilised as a secondary and less important component of grey zone strategies. This is based on strategic penalties such as sanctions, diplomatic condemnation and isolation better targeting the many non-military elements of grey zone aggression.³⁸ As stated by Johnson, 'Anxiety ... [has resulted in] a search for tactical solutions, or an escalation of existing techniques: more airpower, more Special Forces operations, the recruitment of local forces en masse.'³⁹ But he goes on to say that 'Rather than trying to counter the techniques at the operational and tactical level, it has been far better to assert strategic penalties through sanctions, diplomatic condemnation, isolation and strategic positioning alongside allies and partners.'⁴⁰ However, Jordan addresses the need for military integration by highlighting that 'The comprehensive and synchronized use of strategic lines of action combined with the different levels of escalation offers advantages to an actor who resorts to the gray zone over a rival whose defensive strategy is based on classic, linear and inflexible military deterrence.'⁴¹

Finally, addressing the opinion that military force may be the most important lever in the grey zone. Votel et al advocate for 'unconventional warfare' using special operations forces to support local state and non-state actors to achieve objectives. They argue that economic and social interdependence has become so powerful that alternate ways are required to achieve political goals. As stated by Votel et al, 'The complex nature of the future operating environment will often render traditional applications of the diplomatic and economic instruments ineffective or inappropriate.' 'At such times, unconventional warfare might be the only viable option through which the U.S Government can indirectly achieve political objectives.'⁴²

Drawing together these conflicting views, the most developed argument with the greatest support is for a considered use of military force, integrated with the other levers of power. The limited impact of sanctions targeting Russia in 2014, and failure to deter the recent invasion of Ukraine, highlights the limitations of such diplomatic and economic measures.⁴³ Thus, while economic and diplomatic levers will continue to have an important role in applying cost, psychological pressure and signalling commitment, it would be a disadvantage if military force was not also effectively leveraged. As stated by Weissmann 'It is crucial to understand the role of the military in the grey zone. Unless [grey zone threats] can be handled there, the war is likely to have been lost before a conventional war breaks out.'⁴⁴

Holistic cost-imposing strategies

Moving away from the theme of elevated risk and risk tolerance, and the fundamental connection to the argument on use of military force in the grey zone, the final theme for review expands on the need for holistic cost-imposing strategies. Existing grey zone strategies adopted by aggressors such as China and Russia use a wide range of grey zone concepts, approaches and technologies, of which most are non-military in character, to pursue revisionist intent.⁴⁵ Brister⁴⁶ and Matisek⁴⁷ outline how many of these potential objectives, not least due to purposeful avoidance of direct confrontation, are isolated from interdiction by military force. As such, an equally holistic and comprehensive strategy is required to counter grey zone strategies, targeting multiple lines of operation, of which military will be just one element. This is supported by Mazarr, who argues for alignment with departments, multilateral processes and institutions, to achieve the required cooperation and coordination of a multicomponent strategy that renders aggressor 'gray zone campaigns toxic drains on resource and reputation'.⁴⁸

Drawing together the three key themes identified in the literature review, an analysis of academic opinion suggests that the effective application of military force relies on long-term rather than short-term strategies with an expectation of incremental gains rather than grand victories. That the use of military force in the grey zone comes with risk of escalation and miscalculation, however this must be balanced against a need for risk tolerance to signal intent and deter further grey zone activity. Underpinning the first two themes is the need for a holistic cost-imposing strategy that leverages all aspects of power to counter equally comprehensive strategies by aggressors, while maintaining legitimacy and legality. These three key themes of short-termism and the idea of victory, elevated risk and risk tolerance, and holistic cost-imposing strategies, identified as key to effective application of military force in the grey zone will now be used as the framework to analyse the effective use of air power in two relevant and ongoing grey zone conflicts in Iran and Japan.

Section 3 Iran Case Study

This section will analyse Iran's application of air power as part of its grey zone strategy, using the three key themes identified as a framework. The focus is on contextualising and expanding

the relevance of those themes to analyse the effective use of air power in the grey zone. Iran has been selected as the first case study due to being one of the World's foremost grey zone actors who has challenged US ability to respond effectively.⁴⁹ As stated by Mazarr, 'Iran has wielded... [an] impressive array on unconventional, gray zone tools to bolster its influence in the Middle East and beyond.'⁵⁰ These tools have incorporated significant elements of air power, including precision strikes against US bases in the Middle East, but in doing so it has demonstrated both effective and ineffective use of air power to advance its objectives.⁵¹ As such it yields relevant study, particularly in the effective application of a more offensive use of air power in the grey zone.

Short-termism and the idea of victory

This first section will analyse how Iranian key decision makers have contributed to effective use of air power in the grey zone. In analysing Iran's grey zone activity through the first theme of short-termism and the idea of victory, it is argued that Iran have not suffered from short-termism and have been appropriately focussed on incremental gains over a more conventional victory. Since the creation of the Islamic Republic in 1979, Eisenstadt argues Tehran has progressed a consistent asymmetric strategy against US influence in the Middle East.⁵² While diversifying and expanding its grey zone options, for example in response to new technologies, the strategy has retained its core principle of deterrence by punishment.⁵³ As further stated by Eisenstadt, 'Tehran has relied on the same dog-eared playbook for nearly 40 years now.'⁵⁴

This consistency, and its positive impact on the use of air power in the grey zone, is highlighted by Iran's drone programme. Nadimi describes how, 'After decades of steady development, Tehran now uses drones to complement its missiles and broader effort to bring the entire Middle East within its range.'⁵⁵ With development dating back to the 1980s, organisational reform and continued academic and financial support, Iran's weaponised drones now pose a credible threat of punishment throughout the Middle East.⁵⁶ The benefits derived from Iran's long-term strategy of drone development for precision strike are further highlighted by comments from the Commander of US Central Command, General Kenneth McKenzie. Addressing the Senate Armed Services' Committee, he stated that the drones being proliferated by Iran and its proxies 'present a new and complex threat to our forces and those of our allies...until we are able to develop and field a networked capability to detect and defeat [UAVs], the advantage will remain with the attacker.'⁵⁷

This ability to maintain a long-term strategy is argued by Eisenstadt to be due to 'Iran's key decisionmakers...[being] unelected and therefore can often ignore public opinion when it comes to national security matters.'⁵⁸ For example, Ayatollah Khamenei has been Supreme Leader since 1989 and Qassem Soleimani had been the Islamic Revolution Guards Corps-Qods Force Commander since 1998 until his death by US drone strike in 2020.⁵⁹ Additionally, it is argued that Iran believes it is fighting for its survival, but that following the near quarter-million Iranians killed in the Iran-Iraq war, this must be done without escalation to conflict.⁶⁰

These factors are argued to lead to Iran's consistency in progressing revisionist aims it considers essential, but through a nuanced and incremental grey zone strategy that doesn't escalate to war.

In contrast, Western decision makers are often politicians constrained by re-election timeframes.⁶¹ Western decision makers also do not view Iranian grey zone aggression as an existential threat and counter-strategies suffer from many competing commitments, not least from Russia and China.⁶² Taken together, this hampers Western ability to form a coherent long-term strategy. This is then further constrained by erroneous views of the black and white nature of war and peace. Symonds argues that 'the West tends to think about conflict in a binary way: you are either at war or at peace.'⁶³ Eisenstadt supports this view, arguing, 'U.S. decision makers tend to conceive of war and peace with Iran, as well as with other state actors link China and Russia, in stark, binary terms, and have frequently been constrained by fear of escalation.'⁶⁴

Drawing this theme together, analysis highlights key elements that have contributed to the effectiveness of Iran's long-term strategy. Namely, a long-term goal of incremental gains, below the threshold of war, and an early recognition of the asymmetric advantage drone technology could provide. Presently the West is constrained in many ways, hampered by short-termism and an overly simplistic view of peace and war. While the democratic nature of Western nations, and re-elections, will inherently drive an element of short-termism, the West needs to work toward a culture that better recognises the characteristics of the grey zone. This will enable more effective, enduring strategies, that recognise the non-binary nature of the grey zone, and work toward removing the greater freedom currently allowed to aggressors such as Iran.

Elevated risk and risk tolerance

Moving to an analysis of the second theme of elevated risk and risk tolerance. Despite a significant offensive strike component to Iran's grey zone strategy, this rarely leads to miscalculation and unintended escalation, despite frequent reciprocal engagements with the US. As such, Iran poses a compelling example of where offensive military action, including the use of air power, is used as part of a grey zone strategy, while apparently managing the associated risks. This next section will outline the differing arguments on the contribution that Iran's use of offensive air power poses to the risk of escalation and miscalculation, and thus its effectiveness in supporting the regime's aims and objectives.

The first argument is that Iran's development and proliferation of drones to its own forces and proxies has reduced the risk of escalation. Views in support of this include Esfandiari who argues 'Drones have allowed Tehran to maintain plausible deniability even as it carries out covert operations in the region.'⁶⁵ Ostovar further outlines how 'Iran's ability to strike at its opponents through clients provides it a mechanism of retaliation that can have a deterrent effect.'⁶⁶ He expands to state that, funding and support of proxies, including through proliferation of

drones, has enabled Iran to establish a network that has 'transformed into a sophisticated system of power projection that has afforded Tehran immense strategic value.'⁶⁷ These views support an argument that Iran's use of air power, including through its use of weaponised drones, has not only supported its objective of increasing its influence in the region, but has also reduced the risk of escalation through the considerable deterrent effect the precision strike capability poses.

The opposite opinion is given by Lamson, who argues that 'evidence of Iran's new precision-strike weapons capability has been raining down across the Middle East.'⁶⁸ He contends this success means Iran are now at greater risk of miscalculation through over confidence and perception of advantage. He states, 'Iran's reliance on precision-strike weapons to conduct quick, decisive, and offensive responses to enemy actions could easily drive a fast, escalatory cycle of tit-for-tat attacks.'⁶⁹ However, the evidence to date suggests this may be an overly pessimistic assessment. While Iran has demonstrated miscalculation, such as in air strikes on Saudi Arabian oil infrastructure which provoked many countries dependent on Gulf oil, this is one of few examples and saw rapid recognition and adjustment.⁷⁰ For the most part, Iran has shown patience and caution in its decades long struggle against US influence in the Middle East. This was highlighted in the exchanges which led to General Soleimani's death by US drone strike. Despite the potentially severe provocation, the Iranian response involved calibrated missile attacks on an American base in Iraq, with warning to allow US service members time to seek shelter.⁷¹ This clear demonstration of retaliatory strength, followed up by signalling of desire to de-escalate, epitomises Iran's proportional use of force and focus on protraction rather than escalation of conflict.⁷² Votel et al describe this as Iran's 'finely tuned risk calculus'.⁷³

Drawing this theme to a close, it has been shown that Iran demonstrates an effective use of weaponized drones in the grey zone, managing the risk of escalation and miscalculation. This has been to the benefit of increased influence in the region through its proliferation of drones to proxies, associated increased ambiguity of attacks and contribution to highly credible deterrence. For a revisionist State who has elected to pursue an aggressive strategy against US influence, this risk tolerance has likely contributed to preventing US military escalation. However, while this has proved to be an effective use of air power for a regime with reduced interest in legality and upholding international norms, it doesn't necessarily follow as an argument for similar application by the West. Previous experience has highlighted the counter-productive nature of drone strikes that undermine legitimacy and have associated 'blowback' for Western nations upholding international rules and norms.⁷⁴ As such, while the use of drones in the grey zone remains a useful option to be exploited, its use needs to be very carefully considered as miscalculation may have more enduring ramifications for the West. Finally, drones offer a low-cost way for a country, such as Iran, suffering from years of crippling US sanctions to compensate for a lack of a modern Air Force. As such, the West should expect further proliferation and develop an enduring, long-term strategy to counter.

Holistic cost-imposing strategies

This final element of the Iran case study will analyse the extent to which Tehran has integrated the use of air power as part of a holistic cost-imposing strategy and the extent to which this has impacted the attainment of Iran's aims and objectives. To a great extent the literature supports a view that Iran has pursued a wide range of grey zone concepts, approaches and technologies, to support its revisionist intent. Eisenstadt outlines how Iran has 'created a complex institutional setup for projecting influence abroad consisting of both civilian and military entities.'⁷⁵ He expands to explain the setup provides Iran 'with tools and options unavailable to its adversaries-such as terrorism and intimidation, bribery, and unbridled disinformation activities.'⁷⁶ Further adding that Iran is now adding offensive cyber operations to its strategy and 'relies on a variety of nonmilitary means to bolster deterrence-creating economic dependencies in neighbouring states,...[and] building external bases of support for Iranian policy.'⁷⁷ Eisenstadt's analysis is supported by Mazarr who outlines an 'impressive array of unconventional, gray zone tools to bolster its influence in the Middle East and Beyond.'⁷⁸ He states that Iran 'deploys a...extensive network of covert operatives and quasi-military forces through its embassies and other locations. It uses energy diplomacy and the proceeds of oil riches to fund its various causes... It has a well-developed network of proxies...to help carry out its strategic ambitions.'⁷⁹ These measures are argued to have given Iran an advantage in shaping the strategic environment and expanding its influence in the Middle East.⁸⁰ From this overview of Iran's grey zone strategy, it can be seen that many of the tools of Iran's approach cannot be targeted by military means. As such, it follows that an equally holistic approach is required to effectively counter Iran's grey zone aggression.

In summary, this case study has identified that Iran have effectively avoided short-termism to the benefit of progressing an enduring drone development strategy that is now providing significant benefit in supporting Iran's aims of increased influence in the region and protection of the regime. In contrast, the West suffers from short-termism and has been risk averse due to inaccurate and binary perceptions of war and peace, providing Iran with greater freedom for aggression in its use of air power. In considering the accusation that the use of air power increases the risk of escalation and miscalculation in the grey zone, this was not found to be the case with Iran. Instead, it was identified that Iran pursues a highly patient, consistent and finely tuned risk calculus that enables the effective use of offensive air power without escalation to war. Finally, Iran has demonstrated a holistic cost-imposing strategy in its grey zone activity, much of which cannot be targeted by military means. This supports the theme identified in the literature review that the use of air power must be integrated as part of a wider comprehensive strategy to effectively counter the sophisticated grey zone strategies employed by aggressors.

Section 4 Japan Case Study

This section will now analyse a second case study on the effective use of air power as part of Japan's deterrence of Chinese grey zone operations. As with the first case study, the three

key themes identified in the literature review will be used as the framework, with the focus on contextualising and expanding the relevance of those themes to further analyse the effective use of air power in the grey zone. Japan has been selected for this second case study as 'territorial disputes with Japan in the East China Sea (ECS) have been a significant focus of China's grey zone efforts.'⁸¹ While this has predominantly played out in the maritime domain, there has been considerable activity in the air domain also.⁸² The dispute revolves around the Senkaku Islands, which are administered by Japan but claimed by China. Since the Japanese government purchased three features in the Senkaku's from a private owner in September 2012, China has expanded its military, paramilitary, diplomatic and political campaigns to alter the status quo of the Senkaku islands.⁸³ Japan's response to China's grey zone activity in the ECS was one of the first examples of the development of a conceptual framework of grey zone deterrence, laid out within its National Defense Program Guidelines (NDPG) in 2010.⁸⁴ Since then, it has developed this framework further, in 2013 and again in 2019, progressing the adoption of a more responsive and integrated defence force, including increasing use of conventional air power to deter Chinese grey zone aggression.⁸⁵ With the dispute ongoing and growing opinion that 'the trends do not bode well for Japan',⁸⁶ it yields a highly relevant case study in analysing the effective use of air power in deterring sub-threshold and grey zone operations.

Short-termism and the idea of victory

Addressing Chinese grey zone aggression in the ECS and the effective use of air power as part of Japan's response, this next section will consider the first theme of short-termism and the idea of victory. In analysing this theme, and how Japan's use of air power has been influenced by changing priorities or inaccurate perceptions of victory in the grey zone, contradictory arguments have emerged. The scale of change in Japan's Security and Defense Forces (JSDF) since 2010, and increased frequency of NDPG publication,⁸⁷ supports an argument of short-termism. Force posture changes include 'the re-location of defense capabilities... from the northern to the southern part of the country, including the southern island chains.'⁸⁸ Increasing capabilities are highlighted such as the 'acquisition of 147 F-35 fighter jets... an increase of 105 planes from the previous plan',⁸⁹ and 'first time acquisitions of capabilities [standoff missiles and hyper velocity gliding projectiles] that go beyond Japan's exclusively defence-oriented security doctrine.'⁹⁰ Further that Japan's intent to have both defensive and offensive cyber capabilities 'is a significant change from Japan's previous strategies.'⁹¹

Nevertheless, it is argued that despite these changes, Japan's strategic objectives towards China have been highly consistent and always combined both deterrence and engagement.⁹² Berkofsky supports this view stating, 'the restructuring of Japan's armed forces... is comprehensive and ambitious, but does not change the fundamentals of decade-old Japanese security and defense policies.'⁹³ An example in support of the view that Japan has successfully balanced strategic patience with necessary reform, is given by the enduring deterrence by denial concept introduced in 2010. 'As outlined by Liff, the strategy included

the deployment of additional forces to address a defence vacuum and surveillance gap around the Senkaku islands to prevent a Chinese *fait accompli*.⁹⁴ The use of air power to provide persistent intelligence, surveillance, and reconnaissance (ISR), and air interception, has successfully contributed to a view that, 'Japan thus far has been able to successfully counter Chinese attempts to alter the status quo by monitoring, shadowing, and warning off Chinese intrusions... [around the] Senkakus.'⁹⁵

On balance, academic opinion supports the view that Japan's policy makers have effectively balanced long-term consistency with necessary reform, and in doing so have achieved the strategic aim of retaining the Senkaku Islands. However, while the evidence supports a lack of short-termism at the strategic level, Japan have demonstrated a failure to recognise the enduring nature of grey zone competition in tactical elements of its response. This is exemplified by Japan's policy of intercepting and shadowing all Chinese air incursions, to considerable detriment of their F-15 fleet.⁹⁶ This highlights a lack of adequate consideration of the costs this policy would exact over the prolonged timeframe associated with grey zone competition. However, Japan subsequently recognised the unsustainable toll the policy was having, citing in the 2019 NDPG that the policy 'is exacting a chronic burden in its personnel and equipment, generating a concern that JASDF may not be able to maintain proficiency and the volume of its activities.'⁹⁷ The policy was subsequently amended, to reduce the numbers of aircraft scrambled for each incursion and adoption of other measures of surveillance.⁹⁸ However, concern remains that Japan are not planning for the long term and will 'waste its F-35s shadowing Chinese Planes.'⁹⁹

Drawing this section together, the majority of Japanese strategic decision making has recognised the long-term nature of grey zone conflict, setting realistic aims and objectives for the retention of the Senkaku Islands and seen the exercising of strategic patience. However, there are elements to Japan's response that highlight areas for improvement. While the strategy of deterrence by denial around the Senkaku's has been successful so far, including in its application of air power, Japan have yet to adopt an air interception strategy that appropriately mitigates the attrition of China's incursion rate. Unless this is addressed, Japan is playing into China's alleged attrition strategy for altering the status quo of the Senkakus.¹⁰⁰

Elevated Risk and Risk Tolerance

While the previous sub-heading analysed how short-termism and the idea of victory have influenced the effective application of air power in Japan's grey zone deterrence strategy, this next sub-heading analyses the case study from the theme of elevated risk and risk tolerance. Reviewing the literature on this theme, there are two opposing views on the elevated risk of escalation and miscalculation posed by Japan's use of air power. Starting with the argument that Japan's use of air power in the grey zone has elevated risk, to the detriment of Japan's strategic aim of deterring Chinese aggression. As part of a strategy of persistent presence around the Senkakus to prevent a *fait accompli* by China, in February 2016, Japan 'established

the 9th Air Wing in Naha...the enhancement effectively doubled the number of fighters dedicated to responding to Chinese incursions.¹⁰¹ However, this strategy is critiqued as having led to escalation and more scope for miscalculation, with 2016 subsequently a year of rising tensions. This was highlighted in June 2016, when Japan claimed that a PLAAF aircraft nearly fired at a JASDF fighter in the ECS, and again in July 2016 when China accused Japan of aggressive behaviour nearly resulting in a dogfight.¹⁰²

The counter argument however states that China's disinformation campaigns elaborate or fabricate these incidents,¹⁰³ and stresses the need to demonstrate 'a will to protect Japan's sovereignty and independence.'¹⁰⁴ Bothwell supports this position stating, 'signalling is necessary to communicate specific red lines over vital interests through credible commitments, such as sunk costs.'¹⁰⁵ Takahashi goes further, claiming there is an inherent need to 'develop a robust posture to win the possible war in the case of escalation, and to make the challengers recognise the possibility of unfavourable military conflict.'¹⁰⁶ On balance, noting Japan denied the allegations of a near dogfight,¹⁰⁷ Japan's balance of risk tolerance appears appropriately measured to China's growing military assertiveness in the region.

Holistic cost imposing strategies

This final section will provide an analysis of Japan's use of air power as part of a holistic cost-imposing strategy, in response to China's highly sophisticated and comprehensive approach. An analysis of the literature highlights that Japan's current strategy 'lacks several important elements.'¹⁰⁸ Ueki outlines these as a 'lack of strategy for multilateral security institution building',¹⁰⁹ and lack of a 'clear and shared objective with countries such as Australia and the United States'¹¹⁰ on a free and open Indo-Pacific. Further that Japan has been 'slow to react to threats in cyberspace even though the United States has been pushing Japan in that direction for some time.'¹¹¹ In contrast, Japan can be seen to have recognised the limitations to its ability to deal with the grey zone challenge in isolation, through clear signalling within the NDPG of the importance of the regional security ties and the US alliance.¹¹² This was highlighted by President Biden recently reaffirming the Senkaku Islands are covered by the collective defence obligation of the Japan-US Security Treaty.¹¹³ In addition, Japan has played a significant role in the recent resurgence of the Quadrilateral Security Dialogue for cooperation with the United States, Australia and India.¹¹⁴ In turn this has led to the reinforcing of the security partnership with the first joint exercises for 13 years.¹¹⁵ Finally, Japan also continues to engage China thorough business cooperation and other economic and diplomatic measures.¹¹⁶

In analysing this debate, it is argued Japan can improve its grey zone strategy for countering China with a greater focus on a truly comprehensive approach that increases the costs imposed on China. However, Japan has achieved success beyond preventing a *fait accompli*. As argued by Mazarr, 'Japan's new defense guidelines alone, and the tighter partnership it implies with the United States, has probably cost China more in the overall balance of power than it has gained with its rhetoric and land reclamation.'¹¹⁷ Further, that Japan's restraint and proportionality in its strategy has maintained its reputation for upholding international rules

and norms, just as China has undermined its own reputation through its threatening behaviour and failure to abide by such rules.¹¹⁸

In summary, this case study has identified that Japan has been largely effective in avoiding short-termism to the benefit of progressing an enduring strategy of persistent surveillance and defence around the Senkaku Islands. This strategic patience, and recognition that winning in the grey zone looks more like a maintenance of the status quo, has enabled the prevention of a *fait accompli* by China. In considering the accusation that the use of air power increases the risk of escalation and miscalculation in the grey zone, there was evidence to support this. However, this was contrasted with Japan's need to signal clear commitment to protect its territorial integrity, to avoid Chinese miscalculation and act as a deterrent to further escalation. Finally, Japan has demonstrated elements of a holistic cost-imposing strategy in its grey zone activity, including through effective alliance and regional security measures. However, there is evidence that Japan needs to expand its approach to inflict greater cost on China as existing measures haven't prevented increasing aggression in the ECS.

Section 5 Conclusion

In conclusion, this research paper has evaluated the effectiveness of air power in sub-threshold and grey zone operations, arguing that air power has significant utility both as part of a strategy of deterrence by punishment and of deterrence by denial. However, this paper has also identified the need for the use of air power to be integrated into an enduring, risk aware, and holistic cost-imposing strategy to be effective and impose greater cost on an aggressor.

Section one of this paper introduced the concept of grey zone competition. Arguing that, while the grey zone is the manifestation of strategic competition below the threshold of war by actors such as Russia and China, core features may vary between aggressors. This was highlighted through Russia's focus on cyber and disinformation campaigns to undermine political institutions, in contrast to China's focus on expansion and militarisation of artificial islands coupled with deterrence and denial of resources in the SCS and ECS. However, the introduction identified that, regardless of differences in core features and tactics applied by some grey zone aggressors, the central aim of an aggressor's strategy will be the same. Namely the aim to undermine the current international order and gain greater influence and control over spheres of influence.

Following the introduction of grey zone and sub threshold competition, the paper moved to a literature review in chapter two. The review identified three key themes critical for the application of military force to be effective in supporting a grey zone strategy. The first theme was argued to be political short-termism and misperceptions around the idea of victory in the grey zone, challenging the ability of Western democratic nations to adopt and maintain effective grey zone strategies. The second theme was identified as the risk of miscalculation and escalation posed by military activity in the grey zone, contrasted with the need for risk

tolerance to achieve effective signalling of commitment for deterrence. This second theme was found to be central to the debate over the extent to which military forces should be used within the grey zone. The third theme identified that grey zone aggressors have adopted highly sophisticated, holistic grey zone strategies, where many elements cannot be targeted by military force. As such, successful strategies to counter grey zone aggression must rely on an equally comprehensive approach. However, in adopting such an approach, the aim shouldn't be to likewise flaunt international rules and norms, but to maintain legitimacy and proportionality to support a strategy that drains reputation and support from the aggressor. These three themes were then used as the framework for the two case studies.

Expanding on the debate over military use in the grey zone, linked to second theme of escalation and miscalculation, the literature review identified three contrasting trains of thought. The first position argues that the risk of escalation and miscalculation is too high, only offers minor returns, is often counter-productive and other levers such as economic sanctions are far more effective. This position argues that militaries should only engage in conventional deterrence of grey zone aggression, as doing otherwise and targeting ambiguous grey zone activity risks undermining legitimacy through criticism of heavy-handedness and illegality, likely supporting the opponent's narrative. The second opinion argues that military force should be used as a limited and secondary element in grey zone strategies. That while strategic penalties such as sanctions, condemnation and isolation are likely to have greater effect, the synchronization of such activities with different levels of military escalation offers advantages over a strategy which only includes military force in a classic deterrence posture. The final position argues that economic and social interdependence have become so powerful as to render application of diplomatic and economic instruments ineffective or inappropriate. Arguing that, at times, 'unconventional warfare' through use of Special Operations Forces, operating with local state and non-state partners, may be the only viable option to achieve political objectives. This paper concluded that self-limitation to conventional deterrence only, noting the ambiguity of salami slicing tactics employed by aggressors such as China and Russia, is insufficiently nuanced to provide effective deterrence. Conversely it is argued that elevation of military activity in the grey zone above the other levers of power would be a flawed approach. This is based on the fact many aspects of aggressor grey zone strategies cannot be targeted by military means and use of extensive military force can too easily be construed as illegal and heavy-handed, further supporting aggressor revisionist aims. As such, this paper concludes that a balanced approach is required. That while economic and diplomatic levers will remain key, military force has an important role to play in a holistic strategy and as such it would be remiss and act as a disadvantage if not leveraged.

Section 3 moved on to the first of two grey zone case studies, analysing the effectiveness of Iran's use of air power as part of its deterrence by punishment grey zone strategy. Iran was selected as one of the World's foremost grey zone actors that has consistently challenged US and western ability to respond effectively, using one of the greatest amounts of lethal

force compared to other grey zone actors. The case study of Iran's use of air power in the grey zone argued it was however largely effective in progressing its objectives, with only limited evidence of counter-productivity. It was found that Iran effectively used drones as part of a comprehensive strategy to deter by punishment and gain influence in the region. When analysing Iran's strategy, while it has diversified and expanded its grey zone options over time, it has done so with highly consistent aims and objectives. This was found to have supported its effective application of air power through use of drones, highlighted by its successful development programme stretching back to 2011. With the weaponization of Iran's drones today posing a very credible threat of precision attack anywhere in the Middle East. Despite this offensive use of air power, lack of escalation to war was found to be due to Iran's effective pacing and spacing of measured activity in a predictable manner, supporting an effective deterrence by punishment strategy. Finally, Iran has effectively integrated its use of air power as part of a highly comprehensive grey zone strategy that blends capabilities and tactics across all domains to maximise leverage and cost imposed to opponents. While examples of miscalculation exist, Iran has demonstrated an effective ability to identify and adjust course, reinforcing its potent threat to deter and signalling desire for de-escalation at key times. However, Iran's aggressive strategy, while effective at progressing its aims of increasing its influence in the region and ensuring regime survival, has come at very significant cost through crippling economic sanctions and isolation. Thus, utilisation of air power for precision strike, as part of a grey zone strategy needs careful calibration to maintain legitimacy and support the objective of undermining the support and reputation of the aggressor.

While the first case study provided an analysis of the offensive use of air power, the second case study provided a very different analysis of Japan's defensive strategy against Chinese expansionism in the ECS. Analysing Japan's use of air power as part of its deterrence by denial strategy, a number of conclusions were drawn. Firstly, Japan has evidenced mixed recognition of the enduring timeframe associated with grey zone strategies, leading to adoption of some policies that exact a chronic burden on the JASDF. However, on balance, they have maintained long-term consistency, while undertaking necessary reform, and in doing so have achieved the strategic aim of retaining the Senkaku Islands. Early recognition and development of the grey zone as a concept from 2010, with enduring priority on addressing the surveillance and defence gap around the Senkakus, is argued to have been critical in preventing fait accompli by China. Secondly, this paper identified contradictory opinion around the escalatory risk of Japan's increased forward military presence, including its doubling of the number of fighters for interception. The risk of escalation has been highlighted by several confrontations and incidents between PLAAF and JASDF aircraft. However, this paper concluded that Japan has effectively managed this risk and furthermore, is evidence of appropriate risk tolerance. Japan's JASDF reform underlines its commitment and intent to defend its territorial integrity. The signalling of which aids the avoidance of miscalculation by China and acts as a further deterrent. Finally, it was identified that Japan's strategy required greater focus on a more holistic approach to exact greater cost on China. While Japan's use of military force, including

air power, has been successful in preventing *fait accompli*, it was argued that Japan's closer ties with the U.S. and regional partners had contributed most to imposing cost on China and its aims for increasing regional influence.

In conclusion, this paper has argued that air power is effective in the grey zone, both as part of a strategy of deterrence by punishment and a strategy of deterrence by denial. Further that failure to leverage air power's capability acts as a disadvantage to grey zone aggressors who utilise all aspects of power to form a comprehensive strategy. However, in order to compete in the grey zone, this paper identified three key themes for the effective application of air power. Firstly, a need for strategic patience and recognition that gains will be gradual over extended timeframes, likely appearing more as a maintenance of the status quo. Secondly, that the risk of escalation from the use of military force, combined with the need to signal commitment and intent, requires a finely tuned risk calculus. However, the non-binary nature of the grey zone supports a greater risk tolerance than the West currently employ in the grey zone. Thirdly that, as grey zone aggressors have adopted highly sophisticated, holistic grey zone strategies where many elements cannot be targeted by air power, successful strategies to counter grey zone aggression must rely on an equally comprehensive approach. However, these strategies must retain a focus on legitimacy and proportionality to support the objective of undermining the reputation and influence of grey zone aggressors.

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