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Morphological box for the concept of “hybrid warfare”

Abstract

To date, there is no tool for systematically identifying, categorising and comparing different definitions of “hybrid warfare”. Building on previous work by Tom Ritchey, this article presents a method for creating a framework using a morphological box. It briefly reviews the work of Fritz Zwicky and the state of play, constructs a sample list with 76 definitions of “hybrid” and creates the morphological box, the contradiction matrix and the corresponding solution space, pointing out the difficulties encountered at each stage. Despite the highly critical nature of the conclusions that are reached, the study also suggests guidelines for circumventing the problems encountered in the concept of “the hybrid” and is a practical demonstration of the usefulness of Zwicky’s boxes for analysing concepts and definitions.

Keywords

Hybrid warfare, hybrid threat, hybrid operations, morphological analysis, Zwicky.

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There are thousands of works that explain what “hybrid wars” *are* and what they are *not* through the interpretation of facts or texts. This study takes another approach: constructing a metatheoretical framework, using a morphological box, to explain why this exact situation and not any other must be addressed. First, it is important to discuss Fritz Zwicky’s findings and the state of play. Throughout this analysis continuous references will be made to the complex “operations/strategies/threats/warfare/modes of hybrid warfare”. In order not to use such a cumbersome expression, it will be referred to using the generic “hybrid” and sometimes, to avoid repetition, with the far less appropriate but more common expression “hybrid warfare”. This is with the hope that, by incorrectly using the whole and the part interchangeably, the text is a little lighter to read. No claim is made that any one of these expressions captures reality better than any other.

I. Background

I.1. Fritz Zwicky’s morphological boxes

Fritz Zwicky was born on 14 February 1898 in Varna (Bulgaria) and died on 8 February 1974 in Pasadena (USA). Famous for describing the nature of supernovae, explaining the origin of cosmic rays, anticipating the existence of neutron stars decades before they were observed and introducing the concept of “dark matter”, Zwicky eventually attributed his ideas and discoveries to what he called “morphological analysis”. His work at the Aerojet Engineering Corporation between 1943 and 1961 in the search for new fuels to propel missiles was based almost exclusively on it. Morphological analysis attempts to explore the space of all possible solutions to multi-dimensional problems by identifying their relationships (Zwicky, 1966: 114 and Stach, 2010: 32). The full picture of these “configurations” provides an accurate mapping of the answers given so far and answers that no one had thought of.

Morphological analysis has a long history of success, beyond the successes already achieved by Zwicky in, for example, the field of defence, social mediation, new product creation and development (Vartak and Mankar, 2013: 162; for a literature review of more than 70 applications of morphological analysis to as many fields, see Alvarez and Ritchey: 2015). In 2014, Tom Ritchey, an expert morphologist and former director of research at the Swedish National Defence Research Agency’s Institution for Prospective and Technology Assessment, published “On a Morphology of Theories of Emergence”. This article shows how to use a Zwicky box to clarify the concept of “emergent property”, which is widely used in certain philosophical fields, despite being as confusing in nature as the very notion of “the hybrid”.

I.2. “The hybrid” in the discourse of military analysis

As “*hybrid warfare*”, the concept of “the hybrid” first appeared in R. Walker’s doctoral thesis in 1998 and in the title of W. Nemeth’s doctoral thesis in 2002. For

years it languished in the documentary archives of the Monterrey Postgraduate School until Frank Hoffman retrieved it in the form of “war” to label a new type of reality that emerged at the beginning of this century and would characterise future warfare. The push given by Hoffman, McCuen and others attracted the attention of the US Congressional Subcommittee on Terrorism, Threats and Emerging Capabilities, which asked the House of Representatives to open an investigation into whether, officially, a “new type of warfare” called “hybrid warfare” existed. After extensive investigation, the GAO found that the DoD had no definition of “hybrid warfare”, had no intention of formulating such a definition in the future, did not consider that there was anything new that could be designated by such a term and did not use it in any relevant official documents (Sánchez García, 2012: 17 and Pershin, 2016: 79-80). However, after Russia’s annexation of Crimea in 2014, and particularly since 2016, the term has become so popular that a Google Scholar search for “hybrid war” returns 18,100 articles or books that mention it. However, this popularisation has been accompanied by increasingly sharp criticism from some notable specialists. While there is an eloquent asymmetry in the use of the term “hybrid” when used by Russian and NATO analysts, there are three strands of opinion on the term that cut across this divide. Firstly, there are its full-throated advocates, who use it in an unrestricted way, providing different definitions of “hybrid” or none at all. As was mentioned above, since 2016 this camp has been swelling with journalists, politicians and institutions of all kinds. Secondly, a large number of analysts, while not being particularly enthusiastic about it, especially in private, use the term to get along with the former group and because, ultimately, “there isn’t anything else”. Finally, there are those who call “the hybrid” a “catch-all” concept (Jordan, 2017), a “wildcard concept” (Colom, 2018) or, more dramatically, an “intellectual virus” (Pershin, 2016: 63). Their criticisms, so far, have had little resonance, perhaps because members of the first group can always point out that the problem lies not in the concept itself, but in the reality to which it refers. The “hybrid” would be inherently elusive by nature, meaning it could not be covered by the rigorous definitions of traditional military thinking.

2. Objectives of this study

The present study has the following objectives:

2.1. Primary objectives:

2.1.1. Identity the conceptual framework of “the hybrid” by drawing up a list of definitions.

2.1.2. Illustrate the usefulness of morphological boxes for the clarification of obscure concepts by:

- Constructing a “hybrid warfare” morphological box.
- Constructing a “hybrid warfare” contradiction matrix.
- Constructing the “hybrid warfare” solution space.

Related objectives.

- Detect elements that could make the concept of “hybrid warfare” problematic.
- Explain the state of play
- Propose ways to reformulate the concept.
- Exclusion clause: the objectives of this study does not include defining what “hybrid warfare” is or is not.

3. Procedure

3.1. Constructing a sample of definitions

In his study on emergent properties, Ritchey started from a pre-existing typology (Ritchey, 2014: 4-6). However, for this study the preference was to construct our own sample of definitions of “the hybrid”. The purpose of this sample was to establish the conceptual framework in which the definitions given so far are embedded. It therefore seemed logical to build it using diversity criteria. Firstly, diversity of collection methods. Part of it comes from a systematic search in Google Scholar in various languages on the terms “hybrid war”, “hybrid warfare”, “hybrid threat”, “hybrid operations”, etc. Another part appeared incidentally from reading for studies on related topics. The resulting sample includes 37 definitions from 35 sources, plus a further 39 definitions referenced in 16 sources, totalling 76 definitions. They include definitions generated over more than two decades by institutional, academic, military and other sources. Although results were only obtained in English, Portuguese, French, Spanish, Russian and French, documents in other languages were consulted. Due to the criteria that guided the construction process, the sample of definitions is not suitable for a true meta-analysis. The aim was not to be totally comprehensive. Instead, it was intended to be representative, making it possible to perform the kind of study that was wanted.

Contrary to expectations, constructing the sample meant profound decisions had to be made. To start, following a classic handbook on science methodology

(Hempel, 1973: 128) the criterion of considering only explicit “definitions” was applied, i.e. statements containing a *definiendum* (what is to be defined) and a *definiens* (the way in which it is defined). Such a basic criterion has drastic consequences, as it implies that neither Gerasimov’s famous text, “The Value of Science is in the Foresight” (2013), nor the 2005 *National Defense Strategy of the United States of America*, contains a definition of “hybrid”. For a discussion of this point, see section 4.

Nor have did the study consider to be “definitions” those that “define” “hybrid” as a type/mode of warfare that mixes “different” forms of “various” procedures, unless they contain an enumeration of some of these “different” forms or “various” procedures.

In accordance with these two criteria, during its construction, our sample already clearly pointed out a number of problems linked not to the elusive reality of “the hybrid”, but to the way in which its definitions have been made. To begin with, their multiplicity cannot be considered the result of necessity. A clear case in point is Bartosh. Alexander A. Bartosh, a regular contributor to the Russian Defence Ministry’s *Military Thought* magazine, whose tireless work to popularise the concept of “hybrid warfare” might well earn him the title of the “Russian Hoffman”, gives *three* definitions of hybrid warfare in the pages of his 2021 paper on the subject (pp. 25, 42 and 125). The original Hoffman was no slouch either. Two articles by him appeared in 2009. One (“Hybrid vs. compound war”) contains a definition of hybrid *threat*. In the other, (“Hybrid warfare and challenges”), he moves without further explanation from *war* to *warfare*, as is characteristic of him, and provides another different definition. As a result of these practices, there is often confusion among scholars who cite the second article when trying to define hybrid “threats” and the first when trying to define hybrid “wars”. In the long run, such academic inaccuracy seems to have become normal, to the extent that Colom drew up a list of actions with which “hybrid warfare” is equated to demonstrate the ambiguity of the concept (Colom, 2018: 14); this list has been cited as “Colom’s definition”. At this point, constructing the sample required making multiple decisions that would otherwise be completely superfluous. There was a whole series of studies that, while they proceeded to quote the relevant definition (e.g. of “hybrid warfare”), they did so in order to underpin the definition of a different term (e.g. “hybrid threat”), giving a new version of the original definition. All these versions are included as cases of “new” definitions in our sample. However, having made this decision, it was also necessary to include correct citations that only had one version as “definitions”, otherwise the sample would have been biased towards misleading citations.

If, according to Sadowski and Becker (2010: 5), a distinction is made between “material definitions” and “cognitive definitions” of “hybrid”, the definitions contained in our sample would all fall under “material definitions”. Only one should be labelled as “cognitive”, Braspenning’s proposal of “bogged-down hybrid warfare” (“guerre hybride enlisée”):

“Armed opposition between more or less homogeneous political groups, driven by symbols (assumptions, languages, identities, interests, etc.) that help to establish enduring strategic preferences by constructing concepts of the role and effectiveness of material force in political relations between heterogeneous actors, while giving an objectivity to these same concepts to the extent that these strategic preferences appear to be the only realistic and effective ones”¹ (Braspenning, 2001: 5).

	Psychological domain	Social domain	Political domain	Legal domain	Technological domain
With violence	Terrorism	Indiscriminate violence	Coercion	Crime	Cyber-attacks
Non-violent	Psychological methods	Social mobilisation	Political influence	Legal action	Use of networks

Table I Typology of hybrid attacks

This “cognitive definition” differs in its constituent elements from those in the “material definitions” in our sample. Therefore, although it was considered extremely fruitful, it had to be left out of considerations in order to carry out a minimal grouping of these common elements. To make this group, features such as “continuity”, “complementarity”, “non-linearity” and others were omitted, which are present in only a couple of definitions. Others were reinterpreted as simply as possible. For example, several definitions refer to the “cognitive domain”, “culture”, the “symbolic universe”, etc. These have all been included within the “psychology” of the population affected by a “hybrid war”. “Political influence” included “political outreach” or diplomacy, mentioned in some definitions. Finally, “financial threats”, “sanctions” and trade blockades were grouped under the label of “financial” factors (as it appears in the sample, and “economic pressure” as it appears in later steps of the procedure followed here). This grouping highlights the existence of a typology, which is present in most of the definitions listed, as the core of what characterises “the hybrid”. Indeed, if six domains are identified (psychological, social, political, legal, technological and economic-information), it can be seen that five of them can be acted upon in two ways, either using it or violating it. Therefore, this leads to the typology shown in Table I.

In accordance with the above, “psychological means” is understood to mean all non-violent means that allow you to intervene in the “cognitive domain” of the population on which you wish to have an impact. “Social mobilisation” (“society” in the sample) is used to mean ensuring that the target population engages in activities that prevent, block or show how unacceptable it is for the government in question to act in order to repel the aggression it has suffered.

¹ «Une opposition armée entre ensembles politiques plus ou moins homogènes, mus par des symboles (hypothèses, langages, identités, intérêts, etc.) qui concourent à l'établissement de préférences stratégiques durables en construisant des conceptions de rôle et d'efficacité de la force matérielle dans les relations politiques entre acteurs hétérogènes tout en revêtant ces mêmes conceptions d'une valeur d'objectivité à un point tel que ces préférences stratégiques semblent les seules réalistes et efficaces»

A whole series of questions arise from this point, but addressing them in detail would distract from the proposed objectives. For example, several elements of this typology can easily be reduced, as the use of networks, political influence, social mobilisation and psychological means depend, ultimately, on the key element of 21st century wars: the control of screens (television, computers, mobile phones, monitors, etc.) The territory of new wars is no longer shaped by the orography of the land to be conquered, but by pixels. However, as was explained above, these aspects would take the study too far away from its objectives, so they must left here as a proposal. What is far more relevant to the case is examining the fact that the study already has an initial explanation of the unnecessary multiplication of definitions referred to above. Hoffman’s 2007 article unveiled some of the boxes of this typology and, since then, scholars have been intuitively going through it without making it explicit and therefore without exploring it systematically. As a result, it has been unevenly reflected in successive texts. While, for example, there are definitions that list indiscriminate violence as a key factor in “hybrid warfare”, and while there are definitions that mention social mobilisation, none mention *both*. Scholars seem to have assumed that a government that exercises indiscriminate violence against a population cannot, at the same time, generate social mobilisation against the government charged with protecting it - an implausible assumption, especially if you remember that one or both of these actions can be carried out covertly. Similarly, there is clear ambiguity regarding the technological domain. “Technology” appears repeatedly in many of the definitions included here. However, a distinction is rarely made between its *use* (for example, to segment a target population in order to deliver disinformation messages or to stress defence forces through the massive use of drones against communication routes) and technological *aggression* (typically in the form of cyber-attacks). If contingency plans were really to be drawn up using these definitions, no attention would be given to the possibility of indiscriminate violence *and* social mobilisation, or we would try to use the same means to prevent cyber-attacks, the non-violent use of new technologies and cyber-attacks combined with the non-violent use of new technologies. In all likelihood, the resulting measures would be unevenly effective in each situation. However, this study is not concerned here with the development of contingency plans but with the clarification of a theoretical concept.

Six areas have been mentioned but there are only *five* in the typology. Although financial and information elements were in Walker’s original definition of hybrid warfare, until 2009 only Hoffman’s definition of “Hybrid warfare and challenges” included them. However, from 2014 onwards, a flurry of institutional and analyst definitions realised *both* were defining elements of “hybrid warfare”. It can be concluded that the economic-information domain is a strange addition to the typology used up to 2014, and this will be returned to in section 3.4 below.

Having made these clarifications, the sample can now be shown in Table 2.

3.2. Construction of the morphological box

Once the sample was created, making the Zwicky box was easy. The study will now examine the different defining features or elements seen so far, as the parameters of the morphological box and give them an identifying label, what morphological analysis calls “dimensions”. Here is the list of dimensions: name, actor, tactics/training, psychological domain, social domain, political domain, legal domain, technological domain, economic/informational domain, relationship between actors, role model and type of conflict. Table 3 shows the Zwicky box with the corresponding dimensions and parameters.

It is important to remember that the intention is to build a morphological box of definitions of “hybrid” and not an operational contingency plan. Therefore, the morphological box does not include the parameter corresponding to indiscriminate violence

	Operation-strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2 Sample of definitions 1998-2008																										
Walker, 1998: 5			X	X			X	X		X																
Nemeth, 2002: 29				X			X	X																		
Hoffman 2007, 14					X		X	X																		
Hoffman 2007 according to Colom, 2012: 85			X				X	X																		
McCuen, 2008: 108			X				X	X		X																
McCuen 2008 according to Sánchez García, 2012: 20			X				X	X																		
McCuen 2008 according to Sandor, 2019: 310																										
Strategic Vision Group 2008 according to Lasica, 2009: 3			X	X			X	X																		
Casey, 2008: 23		X					X	X																		
Casey, 2008 according to Sandor, 2019: 310			X				X	X																		

Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence.	Society	Coercion	Political influence	Criminal lawlessness	Legal	Tech.	Financial	Information	Symmetry	Asymmetry	Synchrony	Coordinated	Synergy	Open	Covert
Freier 2009 according to Dodonov, et al. 2017: 99		X				X	X	X								X									
Hoffman, 2009a: 15	X					X	X	X							X										
Hoffman, 2009a according to, Sandor 2019: 310			X			X	X	X						X								X			
Hoffman, 2009a according to Dickey, 2015: 7		X				X	X	X		X		X		X		X									
Hoffman, 2009a according to Colom, 2012: 85	X					X	X	X													X				
Hoffman, 2009b: 36	X	X		X	X	X	X	X	X	X		X		X								X			
Hoffman, 2009b according to Danyk, et al. 2017: 6			X			X	X		X				X		X	X	X	X							
Lasica, 2009: 3 and II.		X	X						X																
Calvo, 2009: II		X				X	X	X						X		X					X				
Calvo 2009 according to Sánchez Herráez, 2014: 12		X				X	X	X						X							X				
Calvo, 2009 according to Palacios: 2016 according to Miguel-Gil, 2019: II5		X				X	X	X						X											
US Capstone 2009: 47	X					X	X	X						X											

Table 2 Sample of definitions (cont.) 2009

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2. Sample of definitions (cont.) 2010 - c. 2011	X						X	X														X				
Bi-Strategic Command 2010, 2 according to Espinel 2021: 13							X	X														X				
NATO Capstone according to Aaronson, et al. 2011: 115		X					X	X														X				
NATO 2011 according to Miklauci 2011 according to Banasik, 2015: 26		X					X	X														X				
NATO 2011 according to Miklaucic 2011 according to Sandor, 2019: 310				X			X	X															X			
US FM 3-0, 2011 Foreword: 1-22 and glossary		X				X	X	X	X		X															
US FM 3-0 2011 according to Sandor 2019: 310		X					X	X																		
British doctrine according to MacCulloh and Johnson, 2013: 10				X				X									X									
British doctrine according to Banasik, 2015: 26			X					X									X									

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2. Sample of definitions (cont.) 2010 - c. 2011																										
Bi-Strategic Command 2010, 2 according to Espinel 2021: 13	X						X	X													X	X				
NATO Capstone according to Aaronson, et al. 2011: 115		X					X	X													X	X				
NATO 2011 according to Miklauci 2011 according to Banasik, 2015: 26		X					X	X													X	X				
NATO 2011 according to Miklaucic 2011 according to Sandor, 2019: 310				X			X	X															X			
US FM 3-0, 2011 Foreword: 1-22 and glossary		X				X	X	X	X		X															
US FM 3-0 2011 according to Sandor 2019: 310		X					X	X																		
British doctrine according to MacCulloh and Johnson, 2013: 10				X			X	X										X								
British doctrine according to Banasik, 2015: 26			X				X	X									X									X

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2. Sample of definitions (cont.) c. 2011 - 2014?																										
British doctrine according to Sandor, 2019: 310			X	X			X	X									X									
Israeli doctrine according to McCulloh and Johnson, 2013: 10		X		X			X	X		X		X					X									
Israeli doctrine according to Banasik, 2015: 26		X					X	X		X		X					X									
Israeli doctrine according to Sandor, 2019: 310				X			X	X		X		X					X									
McCulloh and Johnson, 2013: 16			X	X			X	X		X																
McCulloh and Johnson, 2013 according to Banasik, 2015: 25			X	X			X	X		X														X		
McCulloh and Johnson, 2013 according to Sandor, 2019: 310				X			X	X		X														X		
A. F. Rasmussen according to Landler and Gordon, 2014, according to DeBenedictis, 2022: 1				X																						

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence.	Society	Coercion	Political influence	Criminal lawlessness	Legal	Tech.	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2. Sample of definitions (cont.) 2014 - 2015																										
Schroeff and Kaufman, 2014: 862 and 863 and 867.		X	X			X						X														
NATO 166 DSC 15 E bis, 2015, para. 12			X				X							X							X					
NATO 166 DSC 15 E bis, 2015 according to Sánchez Herráez, 2021: 3		X					X							X							X					
Newson 2014 according to Dodonov et al. 2017: 101		X					X		X					X							X					
EEAS, 2015:731			X				X						X												X	
EEAS 2015 according to Fernandes, 2016: 22		X					X							X											X	
Lasconjarías and Larsen, 2015: 3		X	X	X		X	X			X																
Lasconjarías and Larsen, 2015 according to Banasik, 2015: 25		X	X	X		X	X																			
Kiselyov and Vorobyov, 2015: 28	X						X							X												
Kiselyov and Vorobyov, 2015 according to DeBenedictis, 2022: 31				X			X							X												

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2. Sample of definitions (cont.) 2015 (cont.) – 2017			X	X						X				X	X		X	X	X							
Manoilo, 2015: 918				X	X	X	X						X	X	X		X	X	X				X			
EU JoiN/2016/018 final		X			X	X	X	X					X	X	X		X	X	X				X			
Anton, 2016: 509		X		X			X	X	X		X		X	X												
NATO Warsaw Summit Final Declaration 9 July 2016: 72		X		X	X	X	X	X				X													X	X
Cefasi7c2: 14		X					X	X	X	X						X	X									
Cefasi7c2 according to Espinel, 2021: 12	X				X	X	X	X												X						
Dodonov et al. 2017: 98 and 105.			X				X	X	X	X		X	X							X						
ESN17: 18 and 60.	X				X	X	X					X					X	X	X							
ESN17 according to Espinel, 2021: 12	X				X	X	X					X					X	X	X							
MADOC 02/17 according to Espinel, 2021: 12	X						X	X																		

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert	
Table 2. Sample of definitions (cont.) 2017 (cont.) – 2018				X																		X					
Cullen and Reichborn-Kjennerud, 2017: 3				X			X			X		X				X	X	X	X								
Sokolova, 2017: 39				X																							
Andrievskii and Skovorody, 2017: 165			X		X				X						X	X	X	X	X							X	
Zolotukhin and Loginova, 2017: 100			X					X									X	X									
Hybrid CoE 2017?		X			X							X						X	X			X	X				
Hybrid CoE 2017? according to Espinel, 2021: 12		X																				X	X				
Galán, 2018: 3		X										X					X	X				X	X				
Galán, 2018 according to Espinel 2021: 13		X					X					X					X	X									
Konopleva et al. 2018: 89			X							X		X															
Colom 2018: 14 according to Espinel, 2021: 10		X					X	X		X		X						X	X								

	Operation/strategy	Threat	War	Warfare	State	Non-State	Tactics, conventional	Tactics, unconventional	Terrorism	Psychological	Indiscriminate violence	Society	Coercion	Political influence	Criminal lawlessness	Legal	Technological	Financial	Information	Symmetry	Asymmetry	Synchronised	Coordinated	Synergy	Open	Covert
Table 2 Sample of definitions (cont.) 2019 – 2021																										
Monaghan et al. 2019: 3 and 13.			X	X						X		X		X					X			X				
Petrescu, 2019: 280				X	X		X	X				X		X					X			X				
Cubeiro, 2020: 62			X				X	X		X			X						X			X				
Defence Staff according to Santamaría 2020: 13		X					X	X	X					X			X		X							
European Union according to Santamaría, 2020: 13			X						X			X					X		X							
Bartosh, 2021: 25			X		X		X	X				X														
Bartosh, 2021: 42			X				X	X				X					X		X							
Bartosh, 2021: 125			X		X		X	X									X		X							

linked to social mobilisation, nor cyber use or attack. Nor has coercion without political influence been included as it would be inconsistent.

Sets formed by one parameter of each dimension are referred to in morphological analysis as “configurations”. Examples of configurations can be found in tables 5 and 6. A second level of problems emerges here in definitions of “the hybrid”. Indeed, it is now possible to quantify exactly what is meant by the authors who call it “too broad”. Using the morphological box presented by Ritchey to account for the concept of “emergent property”, it can be deduced that it has 4,096 possible configurations (Ritchey, 2014: 12). The morphological field that the definitions of “hybrid warfare” present covers $4 \times 2 \times 3 \times 4 \times 3 \times 3 \times 4 \times 2 \times 4 \times 2 \times 3 \times 2 = 331,776$ configurations. Therefore, this provides a second explanation for the unnecessary multiplication of definitions noted above. Different authors have intuitively grasped the immensity of the morphological field that enumerating the features of “hybrid warfare” leads to and have not been able to resist the temptation to explore it. This is the “attractiveness and expressive force” that Colom attributes to our concept (Colom, 2018: 85). However, once again, by not making it explicit, they have not been able to explore it systematically. Consequently, some definitions have functioned as attractors, receiving successive nuances and recreations. Many other possible definitions, however, have not yet been articulated.

Regardless of whether the facts to which “hybrid warfare” alludes are elusive or not, the definitions of hybrid warfare actually consist of combiner boxes of inordinate breadth. Therefore, the situation does not improve by decreasing the number of traits, because the number is not the problem. The problem is whether they are linked by an “or”, a simple comma, an “and” or a clear hierarchy, i.e. whether or not the essential is separated from the accidental and superfluous. Here is an example. Suppose the traits are restricted to five and given an “abbreviated definition”.

Table 3 *Morphological box for “the hybrid”.*

Name	Actors	Tactics -formations	Psychological domain	Social domain	Political domain	Legal domain	Technological domain	Economic - informative domain	Relationship between the actors	Action model	Type of conflict
Operation - strategy	State	Conventional	With terrorism - Without using psychological methods	With indiscriminate violence - Without social mobilisation	Without coercion - With influence	With criminality - Without legal action	With new technologies - Without attack on computer networks	With economic pressure - Without disinformation	Symmetry	Synchronised	Open
Threat	Non-State	Unconventional	Without terrorism - With psychological methods	Without indiscriminate violence - With social mobilisation	With coercion - Without influence	Without criminality - With legal action	Without use of new technologies - Without attack on computer networks	Without economic pressure - With disinformation	Asymmetry	Coordinated	Covert
War		Conventional and unconventional	With terrorism - Without the use of psychological methods	Without indiscriminate violence - Without social mobilisation	Without coercion - Without influence	With criminality - Without legal action		With economic pressure - Without disinformation		Synergistic	
Method of waging war			Without terrorism - Without the use of psychological methods			Without criminality - Without legal action		Without economic pressure - Without disinformation			

Defabr: “Hybrid warfare consists of the type of activities carried out by a state or non-state actor using conventional or unconventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.”

Morphological analysis shows that this single definition of “hybrid warfare” corresponds to *six* different configurations. It can be debated whether each configuration should be considered a definition, but it cannot be argued that each of them corresponds to *a different reality*:

1. Activities carried out by a state actor using conventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.
2. Activities carried out by a state actor through the use of unconventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.
3. Activities carried out by a state actor through the use of conventional and unconventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.
4. Activities carried out by a non-state actor using conventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.
5. Activities carried out by a non-state actor through the use of unconventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.
6. Activities carried out by a non-state actor through the use of conventional and unconventional tactics and formations, with the use of psychological methods, in pursuit of political objectives.

¡Again, if this “shorthand definition” were used to develop measures to prevent “hybrid warfare”, we would be forced to take measures of varying effectiveness in each real-life situation. *It now be seen why “hybrid warfare” has often been described as “unpredictable”: the immensity enclosed in each of its definitions means it is not possible to foresee, in any way, what is going to be faced.* There will be more on this issue in the next section.

3.3. Contradiction matrix

In general, the systematic exploration of any morphological field requires the elimination of configurations that are impossible, improbable or whose implementation would meet with material, economic or legal problems. To this end, a contradiction matrix is drawn up, indicating which pairs of parameters in each dimension have already been implemented, which pairs of these states have not yet been taken into account and which involve some kind of impossibility. Table 4 shows the contradiction matrix. In this study, the following pairs of traits, which are also present in some definitions of “hybrid” were considered to be impossible, improbable or difficult to implement:

- Despite the common use of the term “covert war” and even if there is no declaration of war, a war implies a majority of overt and overt actions. The parameters “war” and “covert” were therefore considered to be mutually incompatible.
- If “conventional tactics and/or formations” is taken to mean those carried out by units that follow a hierarchy of command and a mode of enlistment set by law, then non-state actors cannot field “conventional units” and it is therefore debatable to what extent they use “conventional tactics”.
- Terrorism cannot be considered compatible with the exclusive use of conventional forces. Whatever is meant by “terrorism”, it falls within the scope of special forces tactics.
- “Economic and/or financial” measures usually means imposing tariffs, blocking goods, sanctions and breaking trade agreements, etc. Non-state actors often appropriate sources of wealth, but they do so for their own financing. On the other hand, implementing, for example, attacks on the tourism sector cannot be compared to these economic measures either. However much they may wish or try, non-state actors rarely have at their disposal what is understood here as “economic pressure”.
- Terrorism is clearly a form of political coercion, so it is impossible for terrorism to exist without political coercion.
- Finally, the existence of economic pressure in a “covert” form, with the meaning just given to “economic pressure”, seems highly improbable.

The above list includes everything the study considered impossible, improbable or difficult to achieve. Of course, these arguments are open to criticism and, on the basis of these criticisms, items will have to be added to or subtracted from the above list. This would alter the structure of the solution space that is obtained, but the essence, the very core of the conclusions that are reached, will remain unchanged. Indeed, as was said in the previous section, what has come to be understood as *a* definition of hybrid warfare always describes *a multiplicity of real situations*. Unless it is accepted that any trait attributed to “hybrid warfare” is compatible with any other trait, it is necessary to conclude that *some of the actual situations contained in each definition refer to something impossible, improbable or difficult to realise*. Specifically, in our “short definition”, situations 4 and 6 cannot ever occur. And this “never” does not mean “under no conceivable circumstances”, it means that they are as likely to exist as low-speed hypersonic missiles or harmless thermonuclear weapons. Again, even if it were possible to discard the impossible, improbable or difficult-to-achieve criteria set out here, any other criterion would lead to exactly the same conclusion: a significant number of definitions of “hybrid warfare” imply the existence of situations that entail a contradiction in terms.

Although discussing everything on Table 4 leads away from the objectives of the study, it is impossible to resist commenting on the surprising fact that none of the definitions that include economic pressure *and* disinformation contain the term “synergistic”. “Synergy” consistently appears in definitions that do not mention either economic pressure or disinformation campaigns. Furthermore, “synergy” does not even appear in the sample along with “technology”,

Tac/form: Tactics - formations.	Withoutterr/Wpsy: Without terrorism - With psychological means.	Withoutcrim/Wlegal: Without criminality - With legal action.
Psy domain: Psychological domain	Wterr/Wpsy: With terrorism - With psychological means.	Wcrim/Wlegal: With criminality - With legal action.
Social Domain: Social domain.	Withoutterr/Withoutpsy: Without terrorism - Without psychological means.	Withoutcrim/Withoutlegal: Without criminality - Without legal action.
Pol domain: Political domain.	Wviol/Withoutmov: With indiscriminate violence - Without social mobilisation.	With: Using new technologies and attacks on computer networks.
Tech. domain: Technological domain.	Withoutviol/Wmov: Without indiscriminate violence - With social mobilisation.	Without: No use of new technologies or attacks on computer networks.
Econ-inf. domain: Economic and information domain.	Withoutviol/Withoutmov: Without discriminate violence - Without social mobilisation.	Wecon/Withoutinf: With economic pressure - Without disinformation.
R actors: Relationship between the actors.	Withoutcoer/Winflu: Without coercion - With political influence.	Withoutecon/Winf: Without economic pressure - With disinformation.
Action Mod: Action model.	Wcoer/Winflu: With coercion - With political influence.	Wecon/Winf: With economic pressure - With disinformation.
Op. / est.: Operations - strategies.	Withoutcoer/Withoutinflu: Without coercion - Without political influence.	Withoutecon/Withoutinf: Without economic pressure - Without disinformation.
St: State	Wcrim/Withoutlegal: With criminality - Without legal action.	Synchron.: Synchronised.
Nst: Non-state.		Coord.: Coordinated.
Conv: Conventional.		Covert: Covert.
Nconv: Non-conventional.		
ConvaN: Conventional and non-conventional.		
Wterr/Withoutpsy: With terrorism - Without psychological means.		

although it is hard to imagine a more perfect storm against a country than a combination of cyber attacks, and the use of social media, economic and information measures.

The contradiction matrix also accurately highlights the common element in the definitions of “hybrid warfare” listed in Table 2. In other words, it *offers a short and precise definition of “hybrid warfare” that summarises all those listed and could well be considered a definition by “consensus”*. Here it is: “hybrid warfare” is a type of conflict in which the existing legal framework is used against one actor (state or non-state), but indiscriminate violence is also used against the target society. Indeed, the definitions that have been cited all coincide in using the term “war” when no legal action is taken or when it is accompanied by indiscriminate violence. By the same token, *a general definition of “the hybrid” has been obtained*, regardless of whether it is considered a “war”, a “method of waging war”, a threat, a type of “operations” or “strategies”. In view of what the contradiction matrix shows, *a conflict can be called “hybrid” if, and only if, it is an asymmetric conflict in which both conventional and unconventional tactics and formations are used*. These definitions are undoubtedly debatable, nominal or peremptory, but they *clearly indicate a limit*. If someone were to formulate a definition of “hybrid warfare” that included legal actions without the use of indiscriminate violence, it would empty the term “war” of its meaning because, by correlating it with *all* the other elements used in the definition of “hybrid”, it would be rendered unnecessary, as it would not add any distinguishing feature to them. The same would be true if someone were to formulate a definition of “hybrid” that includes the use of conventional and unconventional methods in a symmetrical conflict.

3.4. Creation of the solution space

The final stage of a Zwicky box is constructing and analysing the “solution space”, i.e. listing all the configurations that do not have any contradictions. Generally speaking, this task requires the use of IT tools. This study used the tool

Table 5 Policy configuration

Name	Actors	Tactics - formations	Psychological domain	Social domain	Political domain	Legal domain	Technological domain	Economic - informative domain	Relationship between the actors	Action model	Type of conflict
Operation - strategy	State	Conventional	With terrorism - Without using psychological methods	With indiscriminate violence - Without social mobilisation	Without coercion - With influence	With criminality - Without legal action	With new technologies - Without attack on computer networks	With economic pressure - Without disinformation	Symmetry	Synchronised	Open
Threat	Non-State	Unconventional	Without terrorism - With psychological methods	Without indiscriminate violence - With social mobilisation	With coercion - Without influence	Without criminality - With legal action	Without use of new technologies - Without attack on computer networks	Without economic pressure - With disinformation	Asymmetry	Coordinated	Covert
War		Conventional and unconventional	With terrorism - Without the use of psychological methods	Without indiscriminate violence - Without social mobilisation	Without coercion - Without influence	With criminality - Without legal action		With economic pressure - With disinformation		Synergistic	
Method of waging war			Without terrorism - Without the use of psychological methods			Without criminality - Without legal action		Without economic pressure - Without disinformation			

created by Johannes Buchner, astrophysicist at the Max Planck Institute for Extraterrestrial Physics, <https://johannesbuchner.github.io/zwicky-morphological-analysis/>.

Our solution space is a set of 85,824 configurations. Therefore, no matter how many definitions of “hybrid” have appeared so far, there are still tens of thousands of possible definitions that have not yet been articulated (counting only the dimensions and parameters that have been brought into play so far). So as not to prolong the multiplication of definitions, the study will not explore this huge field of possibilities. It will focus on a couple of specific regions in this space. They will be illustrated by two prototypical configurations. Table 5 shows a configuration with states marked in grey. It has been called “political configuration” because the definition that corresponds to it coincides with a standard definition of *political warfare* (FRUS, 1945-50: 1 and Gershaneck, 2020: 65). It is “prototypical” in nature because there are many possible variants of it. The variants on the “Economic and Information Sphere” dimension are of particular interest. No matter which parameter is chosen in it, if the parameters chosen in the other dimensions are kept, variants of a definition of *political warfare* are still obtained. Now it is possible to understand why the economic-information domain appeared to be a strange addition to the typology (see section 3.1). Of course, 2014 will be remembered as the year Russia annexed Crimea, but, in the same year, the concept of “hybrid warfare” annexed a strategic region of *political warfare*.

Table 6 shows a configuration at the other end of the “hybrid warfare” spectrum. It has been called a “war configuration” because it corresponds to the way in which insurgencies, guerrillas, asymmetrical conflicts, etc., are traditionally defined. Once again, variants on it can be introduced that will not significantly alter the fact that what is referred to here is a type of armed conflict that does not need new concepts to understand its reality.

Controversy over whether “hybrid warfare” describes a new type of warfare, and debates about the historical origin of “the hybrid”, now seem sterile. Certainly, there are regions of the “hybrid warfare” solution space that deserve the label “new”, to the extent that they contain configurations that still

Table 6 *War configuration*

Name	Actors	Tactics - formations	Psychological domain	Social domain	Political domain	Legal domain	Technological domain	Economic - informative domain	Relationship between the actors	Action model	Type of conflict
Operation - strategy	State	Conventional	With terrorism - Without using psychological methods	With indiscriminate violence - Without social mobilisation	Without coercion - With influence	With criminality - Without legal action	With new technologies - Without attack on computer networks	With economic pressure - Without disinformation	Symmetry	Synchronised	Open
	Non-State	Unconventional	Without terrorism - With psychological methods	Without indiscriminate violence - With social mobilisation	With coercion - Without influence	Without criminality - With legal action	Without use of new technologies - Without attack on computer networks	Without economic pressure - With disinformation	Asymmetry	Coordinated	Covert
War		Conventional and unconventional	With terrorism - With the use of psychological methods	Without indiscriminate violence - Without social mobilisation	Without coercion - Without influence	With criminality - Without legal action		With economic pressure - With disinformation		Synergistic	
			Without terrorism - Without the use of psychological methods			Without criminality - Without legal action		Without economic pressure - Without disinformation			

have not taken the form of definitions. On the contrary, there are regions of this space that do not deserve such a label at all, as they have been exhaustively explored. If you look at the facts, you find the same result. In all human history, there have probably never been events such as those described in some configurations. Others can be clearly dated and the rest have occurred repeatedly.

At this point, with such a large and multiform solution space, the general advice of morphological analysis is to consider it as a new problem, add constraints to it and go through the process again. In one way or another, this path leads to a reduction and systematisation of the number of dimensions by establishing a clear hierarchy from the indispensable to the additional ones. Of course, a definition does not necessarily capture the essence of reality, but it should at least serve as a map to it, and, as everyone knows, maps are never 1:1 scale. Otherwise, they would be confused with the territory.

4. Discussion

The concept of “hybrid warfare” has been shaped by the peculiar interpretation that some texts have made of others. Although it would be of enormous interest to follow this evolutionary web, morphological boxes do not make this possible and there is not enough space to develop it here, so it will have to remain a pending task.

The construction of the sample involved a series of decisions that may have had a bearing on the final result. It is undeniable that definitions of “the hybrid”, appear “between the lines”, and are hinted at or appear when texts are interpreted in the right way. This study does not confirm it either. It has simply taken the option of creating an *explicit* definition sample. Interested readers are encouraged to follow the procedure used here by using non-explicit definitions. You are sure to draw significant conclusions. Most likely, however, they will include that the results do not differ much from those presented here. In any event, it is important to note that the question of why and how definitions have come to be extracted from texts in which there is no *definiendum* at all is of great interest. If the reason lies in the fact that these texts contain the parameters and dimensions listed here, this would be a confirmation of the relevance of those that were chosen.

The dimensions used here were made according to a systematic typology set out in Table I; another approach could have been chosen based on the frequency with which the different parameters are paired. In this case, the correlation between economic pressure and disinformation, for example, would force them to be placed in different dimensions. A morphological box would then be obtained that is much closer to the definitions actually stated so far. However, it would not be possible to explain why these definitions have appeared and not others. The very attribution of names to such dimensions would be contrived. Key results such as the size of the morphological box and solution space, whether definitions involve impossible situations, etc. would remain unchanged.

The construction process of a morphological box is particularly valuable because it allows for an enlightening dialogue on the topic to be held. It should preferably be carried out by a group of experts and not by an isolated individual. Although this study has tried to account for every step, much of what was obtainable in the process has inevitably been lost. Another key question of morphological analysis also remains to be answered: the procedure for obtaining the parameters and dimensions that make up the Zwicky box; no significant progress has been made on this matter since his time. Although in the case of definitions, the parameters are given by those provided by different authors, we still have no guidelines on how to go beyond them. In exchange for these unresolved questions, it is clear how morphological boxes contribute to the clarification of obscure and difficult concepts.

5. Conclusions

Creating “the hybrid” morphological box, its matrix of contradictions and its space of solutions satisfy the primary objectives of this study. With regard to the derived objectives, we have noted an unnecessary multiplication of definitions of “the hybrid” linked to the immense morphological field opened up by Hoffman in 2007, the combinatorial structure of the apparently simplest definitions, the description by these definitions of impossible or hardly feasible realities, the enormous space of definitions not yet stated, and the way in which “the hybrid” has invaded areas traditionally assigned to other terms, which is the source of its appeal. In fairness, there would seem to be more than enough reasons to consider “hybrid warfare” an “all-encompassing” concept, a “catch-all” concept or, even more, an “intellectual virus”, as Jordan, Colom and Pershin, respectively, have asserted. However, we have also indicated the way to avoid such judgements. All in all, and always bearing in mind the caveats introduced in the discussion, we consider that the potential of morphological boxes for analysing and constructing definitions has been made clear.

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