

This book is dedicated to
YOU

The illustration on the cover of the book depicts the first finite-time singularity dynamic (1495-1945) as a 'turbine' consisting of four accelerating cycles that propels the System to the next level of social integration and expansion. Increasingly severe systemic wars, and non-systemic wars during relatively stable periods, are respectively shown as red and blue discs.

Colofon

2020: WARning

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This study should be referred to as follows:

Piepers, Ingo (2016) *2020: WARning. Social integration and expansion in anarchistic systems: How connectivity and our urge to survive determine and shape the war dynamics and development of the System*. IP-Publications, Amsterdam.

First printed and digital publication, 2016 | version 10-16

ISBN 978-90-826153-0-2

See also: www.global4cast.org

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PREFACE

INTRODUCTION

SUMMARY

If today, thinking it over calmly, we wonder why Europe went to war in 1914, there is no sensible reason to be found, nor even any real occasion for the war. There were no ideas involved, it was not merely about drawing minor borderlines; I can explain it only, thinking of that excess of power, by seeing it as a tragic consequence of the internal dynamism that had built up during those forty years of peace, and now demanded release.

Stefan Zweig, *The World of Yesterday*, 1942

Preface

This book, 2020: *Warning* contains a study with the title: *Social integration and expansion in anarchistic systems: How connectivity and our urge to survive determine and shape the war dynamics and the development of the System* we live in. The study consists of six parts: Part I 'Theory', Part II 'Perspectives', Part III 'Statements', Part IV 'Assessment and Prediction', Part V 'Confrontation' and Part VI 'Theories, Terms and Definitions'.

In this preface, I discuss several main findings of the study, and this preface serves as a bridge to the actual scientific study.

The main results of this study

The conclusions of this study are very straightforward: the system we live in obeys physical laws and is highly deterministic in nature. The system produced - and still produces - two types of wars: systemic and non-systemic wars. Systemic wars qualify as 'world wars' and 'rebalance' the system, whereas non-systemic wars are normally smaller in size and only have limited effects. By means of wars the system releases tensions, that can be understood as free energy that must be put to work, in order to comply with physical laws. This study shows that systemic wars are periodically necessary in anarchistic systems to rebalance relationships among states and to implement upgraded international orders that provide - at least temporarily - relative stability and allow for further (e.g., population) growth.

The system started producing regularities in its war dynamics around 1495, when Europe - the continent that would become the core of the system - became sufficiently connected.

From 1495-1945, the system developed a first so-called self-organized finite-time singularity dynamic that ultimately resulted in a phase transition through the fourth systemic war (the Second World War, 1939-1945). The Second World War (the fourth systemic war) marks the end, and the start of respectively the first and second finite-time singularity dynamic.

The system resumed non-systemic war dynamics following the Second World War. When in 1989 the Cold War ended, the system resumed so-called 'chaotic' war dynamics. The chaotic nature of non-systemic war dynamics explains why these wars are highly unpredictable in many aspects, e.g., timing and duration, despite their deterministic nature. This study shows that the second singularity dynamic will likely also consist of four accelerating cycles.

Based on extensive data analysis and new insights into the workings of complex systems and networks, this study predicts that the system we live in will produce a next systemic war - that is a world war - around 2020. The study shows that the international system is currently 'charging' for a next systemic war. Systemic wars are instrumental in rebalancing the system and in producing relatively stable periods that allow for collective survival and (e.g., population) growth.

The charging of the system - the accumulation of tensions - can be

observed and felt in the system. The number of unresolved issues grows, and unresolved issues and tensions currently accumulate in the system. These tensions can be understood as free energy. Physical laws dictate that free energy will periodically be put to work by means of systemic war, to implement an upgraded order that again allows for a lower energy state (relative stability) of the system.

In this study, I provide overwhelming evidence for these far-reaching statements and also proof that the system in which we live is a highly deterministic and predictive system. We are integral parts of this system, that produces war dynamics through our collective/shared efforts to survive in an anarchistic system that is organized into sovereign states. This study shows that humankind's urge to survive in anarchistic systems and increasing connectivity (population growth) result in 'free energy' - tensions - that in fact drives the war dynamics and develops the system. This study also suggests, that as a consequence of the increasing connectivity of the system, systemic wars will become increasingly severe, and as a consequence potentially cause irreparable damage not only to humankind and its social structures but also to our climate.

The war dynamics of the system are however not without purpose. The finite-time singularity dynamics are instrumental in a process of social integration and expansion in the system and facilitated population growth in Europe from 83 million people in 1495 to 544 million people in 1945.

The regularities I discuss in this study raise the question why these regularities were not discovered in an earlier stage, given the extensive efforts of historians to that end. The reasons that the regularities in war dynamics and the development of the system were not discovered at an earlier stage are simple: historians and social scientists typically focused on the short term or isolated incidents and developments. The regularities that are presented in this study can only be identified from a long-term perspective and furthermore require the use of recent insight into the workings of complex systems and networks. The fact that 'smaller' wars (non-systemic wars) had become increasingly sparse during the 19th and 20th centuries and that the First and Second World Wars (both systemic wars) were wrongly viewed as abnormalities has put us, including historians and other scientists, on the wrong track.

The fact that smaller wars (non-systemic wars during relatively stable periods) have become increasingly sparse during the period 1495-1945 is an effect that can be attributed to the increasing connectivity of the system. This increasing connectivity gradually suppressed smaller wars and simultaneously forced the system to release tensions through increasingly severe and frequent systemic wars.

Furthermore, a 'distortion' of the non-systemic war dynamics of the system during the period 1657-1763 contributed to the inability of historians to identify regularities in war dynamics. These distortions can now be identified and also be explained by using insights into the workings of physical systems.

The study is the outcome of a journey

The study that I present in this book is based on a combination of personal experience - i.e., participation in war (Sarajevo, 1995) as part of the Rapid Reaction Force of the United Nations, and a long-term stay in a country (Java, Indonesia) with a different culture - and extensive study of both war dynamics and the development of the system in which we live.

The experience of war and its effects, and the first-hand observation of humankind's ability to inflict massive destruction and suffering, made me even more aware that we must not and cannot accept such destructive dynamics and behavior from the human and ethical points of view. Moreover, these dynamics cannot be accepted from a very practical perspective; because of (systemic) war's increasing severity and the unavoidable use of nuclear weapons, war will eventually destroy us.

I refuse to accept living in and being part of a system that dictates and ultimately destroys our future because it forces increasingly destructive wars upon us. I do not want my own children, my own children, Mike, Timo and Lisa - or other children in our world - to be confronted with war. We are obligated to stop these dynamics and to work cooperatively on a shared future.

Approximately twenty years ago, I became increasingly intrigued by whether the international system qualifies as a complex system that produces self-organized dynamics and structures that show regularities, that then can be used to predict war dynamics and obtain better control of these dynamics. This interest resulted in a Ph.D. thesis (2006) whose outcome was promising but still inconclusive.

The main conclusions of this initial research were that the international system (1) shows the characteristics of a so-called self-organized critical system, (2) develops as a punctuated equilibrium dynamic, (3) periodically experiences fundamental changes, (4) becomes increasingly stable over time, and (5) is normally chaotic in nature. These initial assumptions (conclusions) turned out to be quite accurate but not complete, which this study shows.

In the following years, I continued to study war and the development of the system. Several years ago, I committed myself again to research, which resulted in this study/report.

Two factors made it possible to make the discoveries that I present and discuss in this study. The first factor is that new insight into the workings of complex systems and networks can also be applied to the dynamics and development of the system. The second and most important factor was my long-term stay on the island of Java, Indonesia, in close contact with local people and communities.

This stay allowed me to study a different culture, different social structures and the dynamics that they generate, and it forced me to challenge the assumptions that underlie my thinking.

I am very grateful for the hospitality that I always encountered in Java, the insight that Java provided, and the sincere friendships that I established during my stay. This stay and the people I met reinforced my conviction that

diversity is essential for our collective survival, simply because it provides us with new insight and solutions to problems that seem unsolvable or that are new to us. Diversity, including cultural and religious diversity, is a prerequisite to our collective survival and the ability to find solutions to the challenges that we encounter. Humankind is just beginning.

We can no longer escape our responsibility.

Initially, I wrote this study for the scientific community; the study is in many respects technical and understandably somewhat complex. What adds to its complexity - and probably also to the skepticism of the scientific community - is that this study does not fit within a typical scientific domain. In this study, I apply concepts related to theoretical physics and network and complexity science to historical and social structures and their dynamics; for this reason, the study is new and does not easily fit in a conservative scientific community.

I am aware that that this study will be received with skepticism, as it should, but I urge and challenge scientists to prove me wrong. I am not a prophet who is predicting the end of the world or someone who is inspired by conspiracy theories or vague spiritual signs; to the contrary, the results of the study are hard science.

As I mentioned, during my research I made some (disturbing) discoveries. The disturbing discovery that the system will become critical around 2020, implying systemic war, is the reason I decided to make this study available to the general public in order to create awareness of this unsettling development and to try to prevent a catastrophe. I urge scientists to validate or falsify the discoveries presented in this study, and politicians to take responsible action.

The discovery that the system is now charging - about to become critical - is understandably a disturbing discovery, but maybe an even more revealing insight that this study provides is that our system is a highly deterministic system, and we have until now been unable to recognize this. This lack of recognition indicates a collective human ability to deceive ourselves. Deterministic laws shape and determine war dynamics, and we comply with these requirements without any awareness or distrust. When these laws want us to fight wars - to release tensions and put free energy to work - we comply. By complying, we are not the masters of our destination and future. It is now time to assume control together to ensure our collective survival and to avoid our collective self-destruction.

Because wars, especially world wars, are the outcome of our shared efforts to survive in an anarchistic system (such as the current international system), our shared commitment is also required to prevent war and to collectively develop other methods that do not result in massive destruction and suffering.

Because this study reveals the underlying mechanisms of war dynamics, it is presently possible to prevent war, at least in theory. No longer is it a matter of being unable to achieve the prevention of war by failing to understand

the workings of the system. It now has become a matter of being unwilling to achieve this.

Presently it is also possible to build robust international orders that do not collapse; this study provides us with the organizing principles that can achieve this. Until recently the architects of our international orders have built organizational 'structures' (like the United Nations), without being aware of the highly deterministic laws and mechanisms that underlie the system's dynamics. Unsurprisingly, these international orders always collapsed and required systemic wars to re-establish order. International theorists can be compared with architects who built skyscrapers without being aware of the existence of gravity and its effects. Now collapse of international orders can be avoided, and it is our responsibility to achieve this.

I would like to thank especially three persons for their crucial support during the making of this book: Ida Suryani, my partner for her continuous support and patience, Jaap Wolters who took charge of the lay-out of the book, and provided me with very valuable communication advise, and Bert Laker for his support in building the website and ensuring the book's digital distribution.

I dedicate this study to you, for the very simple reason that you - along with myself - are part of the war dynamics that the system produces. However, as this study also shows, each one of us is also part of the solution to this self-destructive dynamic: It is now time to act.

Ingo Piepers

Borobudur, Java, Indonesia
Amsterdam, The Netherlands
September 2016

Introduction

Major findings

Until now, we have been unaware of the deterministic nature of war dynamics and the development of the System. This study not only reveals the deterministic nature of the System and its dynamics but also demonstrates that a deeper – and simple – order underlies the System: The ‘chaotic’ and ‘complex’ dynamics of the System result because the System obeys certain physical laws”.

It is fair to say that ‘history’, historical research methods, international relations theory, and similar academic disciplines lack organizing principles and a scientific framework. Until now, these ‘sciences’ were concerned only with contingent dynamics and remained unaware of the existence and impact of an underlying highly deterministic domain.

In this study, I show that the System periodically becomes critical for short intervals of time and produces systemic wars to release tensions that have built up within it. These tensions are equivalent to energy – to which physical laws apply. In contradistinction to what we have assumed until now, this study reveals that the System – and specifically its dynamics and development – is highly deterministic in nature.

States and their populations constitute an anarchistic System. Anarchistic Systems, this study shows, regulate energy (tension) production and its use by means of self-organized finite-time singularity dynamics accompanied by accelerating cycles that are the ‘products’ of the physical laws that apply to the System.

Finite-time singularity dynamics ensure an optimal balance between order and disorder in the anarchistic System and ensure its performance and evolvability. The performance of the System refers to its ability to fulfill the basic requirements of states and their populations, whereas evolvability refers to the System’s ability to make timely adjustments to its order (organization) in response to changed circumstances and conditions. In so doing, singularity dynamics enable population growth, while this population growth simultaneously further drives the development and unfolding of singularity dynamics.

Because of their path dependent dynamics and lock-in on war, singularity dynamics not only constitute ‘war traps’ but also are instrumental in implementing upgraded orders in the System. Successive upgraded orders help implement increasingly comprehensive organizational arrangements that underpin successive international orders. Singularity dynamics are thus instrumental in the long-term process of social integration and expansion (SIE).

Three shortcomings in particular have frustrated our ability to fathom the real nature of the System: (1) the chaotic nature of non-systemic wars; (2) that the (accelerating) cycles that accompany finite-time singularity dynamics are the natural units of analysis of the System that expose the System’s

properties and their very regular development; and (3) the distortion of the System's war dynamics during two 'exceptional periods'.

The majority of wars in the System, which includes all wars except for four systemic wars, are non-systemic and mainly chaotic in nature. Chaotic war dynamics are intrinsically unpredictable; regularities cannot be identified/observed if this simple fact is not taken into consideration.

However, four wars that the System has produced since 1495 were systemic in nature and highly predictable. Systemic wars not only define the long-term development of the System in the direction of increasing levels of integration but also accelerate the cycles that accompany finite-time singularity dynamics.

As I explain herein, systemic wars are produced at an accelerating rate, which is in line with the physical laws that apply. Each cycle consists of a relatively long, relatively stable period in which the System produces non-systemic wars, which is followed by a relatively short critical period (systemic war). These cycles constitute the natural units of analysis of the System, and their properties (also) reveal the deterministic nature of the System and the System's very regular (and predictable) dynamics.

During two 'exceptional periods' (1657-1763 and 1953-1989), as I have defined them, the war dynamics of the System were temporarily disturbed. During both of these periods, the intense rivalries between two Great Powers (Britain and France in the earlier period and the United States and the Soviet Union in the later period) decreased the number of degrees of freedom in the System to two, thus compromising the ability of the System to produce chaotic non-systemic war dynamics.

The insights I present and discuss in this study are new, and they offer us the opportunity to assume control of the war dynamics of the System.

This study shows that the System will again become critical around the year 2020 and will thus produce a systemic war to put the energy (tensions and unresolved issues) in the System that has accumulated – and that is accumulating now – to work to implement an upgraded order that again fosters a lower energy state and a new, relatively stable period.

The study suggests that the second finite-time singularity dynamic is accompanied by four accelerating cycles and will reach the critical connectivity threshold and produce a phase transition in approximately 2185.

Systemic wars – world wars as we call them – will necessarily (because of the physical laws that apply) become increasingly severe and intense and will cause immense human suffering and destruction. Application of the destructive energy that is required to rebalance the System could result in collective self-destruction, not only because of the scale of human suffering and destruction but also because of the damage that will be inflicted on our climate if nuclear weapons are deployed, as can be expected.

The war dynamics of the System are self-organized; in other words, they are the outcome of multiple interactions between states and their populations, which indicates that we are all not only part of the problem but also

part of its solution. This study provides us with the (basis of the) knowledge to prevent these war dynamics and to develop means other than war that can be employed to periodically rebalance the System.

We should realize that current efforts to prevent and mitigate the effects of climate change – which is also vital for our survival and well-being – could well become superfluous if we do not effectively take control of the potentially self-destructive war trap we collectively produce.

The regularities and mechanisms I expose in this study can contribute to a fundamental change. However, they are only a start: there is much (more) to discover, to understand, and to improve in the framework I present in this study. This study makes it possible to develop effective strategies to prevent war and to design international orders that can avoid war, at least in theory. I hope this study provides us with the necessary insights and awareness to make fundamental changes to our System and to our behavior.

Our efforts to achieve our objectives will reveal whether we can exercise control over our free will and our collective destination, or it will show that we continue to be obedient followers of physical laws, which will again set a war trap for us.

Methods

To identify the consistencies and ‘construct’ the theory that I present and discuss in this study, I made use of insights into the operation of networks and complex systems, in addition to concepts from theoretical physics (criticality, phase transitions, and others).

By applying an iterative process of ‘construction’ and empirical testing, a consistent and relatively simple theory emerged: The System represents the production, release and use of energy, to which physical laws apply; the System and its dynamics and development are highly deterministic in nature; and physical laws ‘force’ the System to implement upgraded orders, which then enable (further) integration.

The System and the finite-time singularity dynamics accompanied by the cycles it produces are instrumental in fulfilling the basic requirements of populations that have ‘clustered’ in states (also a product of the first finite-time singularity) and ensure their collective survival. Through singularity dynamics, anarchistic Systems enable(d) population growth, which then further power(ed) the development and unfolding of the singularity dynamic.

The framework/theory also allows for prediction, but the accuracy of its predictions must still be tested: I expect the System to become critical again in approximately 2020 and to produce a systemic war to implement an upgraded order and to ensure compliance with the physical laws that apply to the System.

In this study, I make particular use of the war data provided by Levy (38), which are complemented by a number of other data sets (25), (52), (59).

The results I present in this study and the theory I develop are just a

beginning; more research is required to confirm or refute the research results I present and discuss in this study.

I am convinced that the results of this study (finally) give us the opportunity to fundamentally improve our understanding of the workings of the System, its dynamics, and our role in them and to develop policies to avoid becoming caught up again in an accelerating war trap that could lead to our collective destruction.

However, this problem – as is the case with (the effects of) climate change – can be solved only with the support of everyone in the System; for that reason, I dedicate this study to ‘everyone’.

Presentation

It is a challenge (at least for me) to explain these new insights and the theoretical framework I developed in this study by means of iteration not only because it is a fundamentally different – ‘new’ – approach to studying the dynamics and development of the System but also because of the far-reaching and new insights this study provides. It is evident that a paradigm shift is now necessary (and possible).

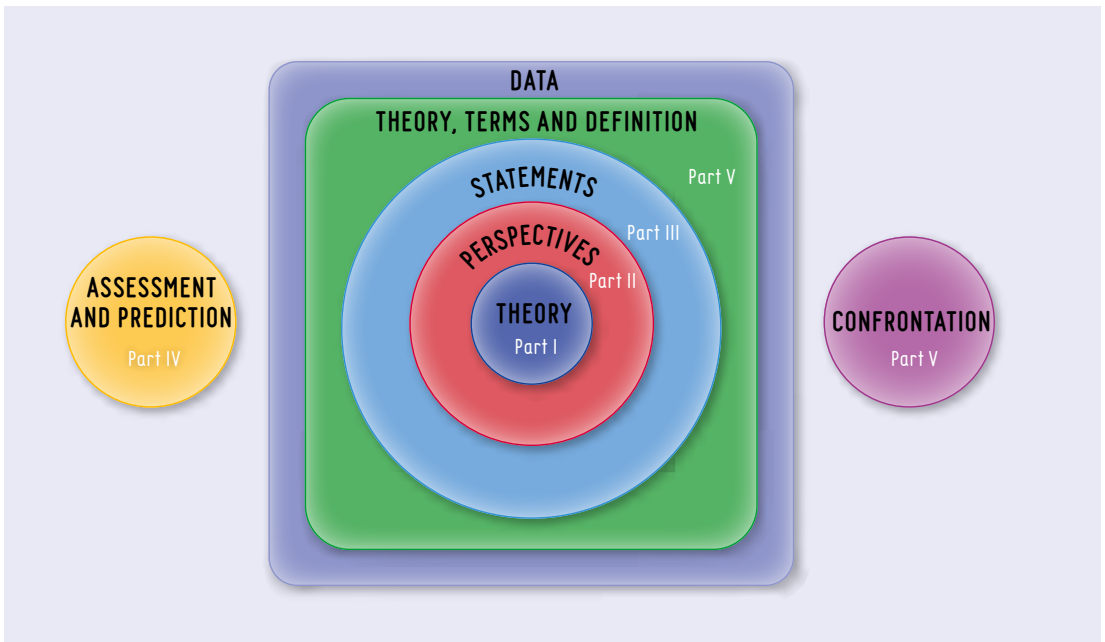


Figure 1 This figure shows the structure of this study and its presentation.

In the first part (*Theory*), I present the main components of the theory. In so doing, I present the theory by means of a number of related ‘statements’ that each addresses a particular point/subject.

In Part II (*Perspectives*), I discuss fifteen different ‘perspectives’ that

address different aspects and components of the System. These perspectives are complementary.

In Part III (*Statements*), I discuss 323 statements; the statements address particular issues related to the theory. These statements are grouped in twenty subjects. The Statements and the subjects overlap to a degree. To arrive at a better understanding of the functioning of the System, in a number of cases I address particular issues from (only slightly) different perspectives.

The next section – Part IV (*Assessment and Prediction*) – is specifically dedicated to assessing the current condition of the System and to predicting its dynamics and development over both the short and long terms. Part IV represents a combination of theory and statements related to assessments and prediction.

In Part V (*Theory, Terms and Definitions*), I discuss some theoretical issues associated with networks, complex systems and theoretical physics that are related to and/or apply to the System and its dynamics. I also provide a list of the terms and definitions that I introduce in this study as a reference.

In Part VI (*Confrontation*), I challenge historical research and certain dogmas in international relations by applying the theory developed in this study. This confrontation reveals a number of fundamental shortcomings in both the historical research (methods) and in international relations theory that must be resolved to ensure that they are of use and that they provide proper policy advice.

In Part VII, the data I used in this research are presented.