



**IMSIS**  
International Master  
Security, Intelligence  
& Strategic Studies



**Erasmus  
Mundus**

# **EU and UK Space Security Policies Through the Lens of Historical Institutionalism**

**July 2021**

**GUID: 0708992T**

**DCU Student Number: 19108389**

**Charles University Student Number: 22145429**

**Presented in partial fulfilment of the requirements for  
the Degree of  
International Master in Security, Intelligence and Strategic Studies**

**Word Count: 21,254 words**

**Supervisor: Dr. Eamonn Butler**

**Date of Submission: 23<sup>rd</sup> July 2021**



**CHARLES UNIVERSITY**

## Acknowledgements

I would like to thank the following people, who massively helped me to complete this research and my master's degree.

The IMSISS staff teams and especially my supervisor, Dr. Eamonn Butler, whose knowledge and expertise guided me through this research. Special thanks to Ms. Sandra Dopico-Ardao and Dr. Alex Collins for their great support and care.

My fellow IMSISS course participants who have greatly supported me and who have been a fantastic team to work alongside as we have embraced all the challenges of the IMSISS programme over the past two years.

My colleagues at the Austrian Institute for European and Security Policy in Vienna who gave me great insights and inspired me with their professional outlook.

My biggest thanks to my parents, Richard and Joyce, for all their love, care and attention. Thank you for helping me to succeed. Thank you also to my friend, Alice, who believed in me from the beginning.

## Abstract

The main purpose of this research is to explore the relationship between the EU and UK in terms of space defence policy developed from the viewpoint of historical institutionalism. As a research objective, it is intended to assess the nature of historical institutionalism as a concept and its applications to space defence policy. Another objective is to trace the historical development of the relationships between the EU and the UK in the space sector. Finally, this historical development is discussed through the lens of historical institutionalism.

The attainment of these aims and objectives requires an optimal choice of methodology and research design. This study has been guided by the principles of interpretivism, a dominant philosophical stance in social studies. This philosophy emphasises the role of interpretations in the attainment of knowledge due to a lack of absolute truth, as according to interpretivism, the truth depends on the observer and their interpretations. In line with this philosophical stance, this research is conducted using an inductive approach, which stipulates theory development, hypothesis formulation, or new proposition statements based on observations. This contrasts with deductive testing of existing research hypotheses. The choice of an inductive approach has determined the use of a qualitative research design for this study.

The main feature of the qualitative research design is that the study relies on both qualitative data and qualitative methods of data analysis. Qualitative data implies non-numerical information. The study uses secondary data retrieved from open sources such as academic journals, books and government official documents. The qualitative methods used in this research are narrative and thematic analysis. Narrative analysis implies storytelling and the historical discovery of the studied phenomenon through the lens of historical institutionalism. Thematic analysis implies summarising key findings, finding similarities and differences, extracting common themes and makes conclusions based on the observations. While the qualitative research methods adopted in this study do not allow for making generalisations of the findings or allow for the testing of research hypotheses, they do however allow for an in-depth evaluation of the space security policies of the UK and the EU as viewed from the perspective of historical institutionalism.

The main feature of historical institutionalism is that it combines the concepts of structure and processes, which makes it different from alternative theories such as Rational Choice Theory and Sociological Institutionalism. The findings of the first objective of this research study suggest that historical institutionalism explores historical processes over time and through the institutionalisation of these processes. Historical processes are a combination of deterministic elements and random events that shape the ultimate norms and rules in space security policies.

In particular, the results of this study reveal that these space security policies have been developed in the wake of the post-war period in Europe where the United Kingdom took the lead in the space sector as a leading economy and military power of that time. However, these attempts to lead independently resulted ultimately in failure. The UK had to resort to partnerships with European countries once funding was insufficient and costs were too much for the UK to manage alone. Partnerships with European countries allowed the UK not to waste funds that had already been invested in its own space programme.

The development path of UK space security policies could have been different if it had continued to partner with other allies such as the United States instead of Europe. Nevertheless, their final choice was in favour of European countries, which in turn were not supportive of the idea of partnering with the US in space security as more autonomy was sought. Over the historical period of its space policy development, the UK had occasionally turbulent relationships with European countries such as Germany and France. Ultimately, the UK and EU have parted company with regards to their space security policies. The latter was more recently facilitated by Brexit and the withdrawal from the international space programme, Galileo. Historical Institutionalism is in part focused on the concept of junctures and the results of this study reveal that there have been several critical junctures in the space security policy of the EU and the UK such as the refusal to accept the UK as a member of the EEC, the Kosovo conflict in the 1990s that led to the emergence of an autonomous EU satellite infrastructure, and the UK's withdrawals from Galileo and its past economic failures.

The results of this study bear witness to its limitations such as the relatively scarce amount of theory-based literature analysing space security policies. Another

limitation is that the results of this study are not generalisable because they focus on a specific context. The theoretical framework of historical institutionalism is effective in analysing past events, but it is a poor fit for making projections about the future. An effective framework that would be more forward-looking could be beneficial for policymakers. It is also valid to mention the lack of access to primary data as a serious limitation to this research. In light of the limited information available from secondary sources, future studies should arrange interviews with experts in the field from both the UK and the EU to also gain their insights on the historical development of their space security policies and their vision for the future of these policies. It is also recommended that future studies should compare the development of UK and EU space security policies with those of the US, as a major strategic ally. Moreover, it would be interesting in future studies to divide the policies into military and civil segments to gain more insight into the influence of both and to trace the differences in their historical development.

## Contents

Acknowledgements .....	2
Abstract .....	3
List of Abbreviations.....	8
Glossary of Terms.....	9
<b>1. Introduction</b> .....	<b>10</b>
1.1. Motivation for the Study.....	11
1.2. Aim and Objectives .....	12
1.3. Structure of the Study .....	12
<b>2. Literature Review</b> .....	<b>14</b>
2.1. Empirical UK and EU Space Security Evidence .....	14
2.2. Theoretical Evidence of EU and UK Space Security.....	15
2.2.1. Conceptual HI Evidence in EU Policy .....	16
2.3. Analysis of Historical Institutionalism .....	18
2.2.1. Competing Theories.....	22
2.3.1. The Choice of HI as Theoretical Perspective for this Research .....	29
<b>3. Methodology</b> .....	<b>31</b>
3.1. Research Design .....	31
3.2. Data.....	33
3.3. Research Methods .....	33
3.3.1. Narrative Analysis.....	34
3.3.2. Thematic Analysis.....	36
<b>4. Analysis</b> .....	<b>38</b>
4.1. UK Space Policy.....	38
4.2. EU Space Policy.....	46
4.2.1. Europe’s first commitments to space cooperation .....	46
4.2.2. The European shift into space .....	49

4.2.3. The Galileo and Copernicus Projects.....	51
4.3. Summary.....	55
<b>5. Discussion</b> .....	<b>57</b>
5.1. Discussion of the Theoretical Framework .....	57
5.2. Discussion of Empirical and Conceptual Findings.....	59
5.3. Perspectives on UK Space Policy in Light of Brexit .....	64
<b>6. Conclusion</b> .....	<b>65</b>
6.1. Summary of the Study.....	65
6.2. Limitations of the Research.....	67
6.3. Recommendations for Further Research .....	68
<b>References</b> .....	<b>69</b>

## List of Abbreviations

<b>BNSC</b>	British National Space Centre
<b>CEC</b>	Commission of the European Community
<b>DDS</b>	Defence Space Strategy
<b>EC</b>	European Commission
<b>EEA</b>	European Economic Area
<b>EEC</b>	European Economic Community
<b>EGNOS</b>	European Geostationary Navigation Overlay Service
<b>ELDO</b>	European Launcher Development Organisation
<b>EP</b>	European Parliament
<b>ESA</b>	European Space Agency
<b>ESP</b>	European Space Policy
<b>ESRO</b>	European Space Research Organisation
<b>EU</b>	European Union
<b>EUSPA</b>	European Union Agency for the Space Programme
<b>GMES</b>	Global Monitoring for Environment and Security
<b>GNSS</b>	Global Navigation Satellite Systems
<b>GPS</b>	Global Positioning System
<b>GSA</b>	European Global Navigation Satellite System Agency
<b>HI</b>	Historical Institutionalism
<b>JRC</b>	Joint Research Centre
<b>NASA</b>	National Aeronautics and Space Administration
<b>NATO</b>	North Atlantic Treaty Organization
<b>NSS</b>	National Security Strategy
<b>PeSCo</b>	Permanent Structured Cooperation
<b>PPP</b>	Public Private Partnerships
<b>RCT</b>	Rational Choice Theory
<b>SATCEN</b>	European Union Satellite Centre
<b>SDI</b>	Strategic Defence Initiative
<b>SEA</b>	Single European Act
<b>SI</b>	Social Institutionalism
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>USA</b>	United States of America
<b>USSR</b>	Union of Soviet Socialist Republics
<b>WEU</b>	Western European Union



## Glossary of Terms

1958 US-UK Mutual Defence Agreement	A bilateral treaty between the United States and the United Kingdom on nuclear weapons cooperation.
Blue Streak	British Intermediate-range ballistic missile and later the first stage of the 'Europa' satellite launch vehicle.
Copernicus	The EU Earth observation programme managed by the European Commission in partnership with ESA, EU Member States and EU agencies.
Critical Juncture	Situations of uncertainty in which decisions of important actors are causally decisive for the selection of one path of institutional development over other possible paths.
Europa	An early expendable launch system of the European Launcher Development Organisation.
Galileo	A global navigation satellite system created by the European Union through the European Space Agency.
Game Trees	Graph representing all possible game states typically within a sequential game.
Historical Institutionalism	A new institutionalist social science approach that emphasises how sequences and path dependence affect institutions.
Isomorphism	A similarity of the processes or structure of one organization to those of another, be it the result of imitation or independent development under similar constraints.
Path Dependence	When decisions are dependent on previous decisions or experiences made in the past.
Polya Urn processes	A type of statistical model used as an idealized mental exercise framework.
Skylark	A family of British research rockets launched between 1957 and 2005.
Social Institutionalism	A form of new institutionalism that concerns how institutions create meaning for individuals.
V-2 missile	The world's first long-range guided ballistic missile.

## 1. Introduction

In the 21st century, the space race has reignited but now includes far more previously unexpected world actors<sup>1</sup> (Davis and Ebinama, 2021). The improvement of international cooperation norms in outer space promotes both national interests and common interests of the international community (Jiang and Zhao, 2021). The leaders will be the ones who can better capitalise on the social and economic opportunities offered by space science and technology. Such global space technology already encapsulates many aspects of daily life and is spread easily via services provided through satellites (EP, 2020). What was unimaginable in this field a few years ago has become reality and such technologies are now a natural and essential element of everyday life. Space-based technologies and their extensions may provide even greater benefits tomorrow and further into the future.

The UK embraces and takes into account these opportunities as underlined in its Civil Space Strategy (HM Government, n.d.). However, along with potential rewards, the plausible risks of space exploration should be well understood and the country should be prepared to address these risks as they emerge. These risks may include accidents and natural hazards in space as well as the threat of deliberate attacks by organised groups of non-state actors or competing states. China, North Korea, and Iran could conceivably be involved in hazardous space activities including satellite interference or intentional or unintentional satellite collisions (Zenko, 2014). The UK National Security Strategy (NSS, 2010) considers disruptions of data obtained, transferred or aggregated by satellites as a substantial security threat for the country. The Strategic Defence and Security Review issued in March 2021, substantiated the need for a National Space Security Policy following Brexit to further consolidate and structure the civil and military factors of its space security.

Space officially became a sphere of strategic EU interests in 2009 when the Treaty on the Functioning of the EU, known as the Lisbon Treaty, was adopted (Piris, 2010). Since then, Europe has had its own space-oriented policy, which the UK had adopted

---

<sup>1</sup> The African Union, for example, has named space activities as one of its 15 priorities and the Union has established a continent-wide space agency to support existing programmes and to establish new ones. See Davis and Ebinama (2021).

until Brexit (EP, 2020). The EU's largest and most famous project is Galileo<sup>2</sup> which stipulates the development and deployment of a global navigation satellite system (GNSS). After initial crises (Plattard, 2008), Galileo has since progressed significantly in its implementation. As of 2021, 26 out of its 38 satellites are already in orbit (EUSPA, 2019). Full operational capacity was originally planned for 2020, but this has now reverted to the 2020s for the launch of its remaining fleet (Yalvac, 2021). It was the first space-connected infrastructure owned by the EU and was seen as a potent symbol of European cohesion and power (Lahcen and Andrijasevic, 2021). As opposed to other public policies typically designed by a single governing body, the European Space Policy (ESP) is developed at three levels, namely: the national, the international and the transnational levels. This means that competencies are apportioned between state governments and their particular agencies, that is, ESA and the EU.

### **1.1. Motivation for the Study**

The motivation for this research study is the following. Space is becoming an increasingly important sphere of supranational interaction and partnership. Europe has a very active regional space programme working alongside its national space programmes. The rest of the world has regional initiatives of a much more *ad hoc* nature (Jakhu and Pelton, 2017). Global space projects cannot easily be implemented by a single country and an international coalition is required<sup>3</sup>. In addition, each ESA member state has its space security policies drawn up in accordance with that state's interests which also stipulates the spheres and boundaries of its integration efforts with other space powers. Levels of engagement between European states vary in the fields of science and exploration, earth observation, navigation, human space flight, launchers and telecommunications (Adriaensen et al., 2015). The motivators for involvement in space also vary between states. These factors can include job creation, social benefits, industrial

---

<sup>2</sup> Galileo is a global navigation satellite system that went live in 2016, created by the EU through ESA and operated by the European Union Agency for Space Programmes (EUSPA).

<sup>3</sup> The creation of the U.S. *Space Force* at the end of 2019, French moves toward setting up a similarly dedicated military space body, and NATO's formal recognition of space as a zone of military operations have all clearly indicated the beginning of a new era in the second decade of this century. See Steer, C. and Hersch, M. eds., 2020.

competitiveness, technology development, social benefits, international cooperation and European non-dependence.

Since Brexit, the UK has become the sole protector of its space interests (Cakir, 2021). The EU can still be considered as a partner but it has its interests as well. The UK-EU relationship will continue but it is important to understand the extent of this relationship. To understand the possibilities for their future interactions, it is important to examine their relational history and its current state of affairs. It is also essential to outline the current space policies of both parties to compare potential issues and obstacles to further integration. Moreover, the recently initiated Brexit process again imposed its limitations on their interactions, and it is necessary to comprehend the limits of these constraints as far as possible. This all represents significant interest for the research and is explored in the study.

### **1.2. Aim and Objectives**

The study aims to establish how the space partnership relationships between the EU and the UK have developed from the viewpoint of historical institutionalism. This stipulates that the following objectives must be attained:

- to determine the nature of historical institutionalism and its effect on relationships between states;
- to explore the history of partnership between the EU and the UK in the space security field;
- to investigate how Brexit affected the EU-UK partnership in terms of space defence.

### **1.3. Structure of the Study**

The chapters of the study are organised in the following way. Chapter 2 is the literature review which has three main purposes. It firstly overviews three closely related theories which could represent the theoretical framework for the study, namely historical institutionalism (HI), social institutionalism (SI) and rational choice theory (RCT). The strengths and weaknesses of each theory are outlined and the choice of HI as the framework for the study is substantiated. Secondly, it analyses the literature on the use of HI to explain European space security policy. Finally, it examines the literature on space security policy for the UK and the EU.

Chapter 3 is dedicated to the research methodology. It formulates the research design, outlines the sources of the data and the research methods. The chapter also explains why narrative analysis and thematic analysis are chosen as the main research methods. Chapter 4 focuses on the main analysis. In particular, the history of the relationship between the UK and the EU is explored, the main concepts in the sphere of space defence are examined and prerequisites for further partnerships after Brexit are analysed. Chapter 5 discusses the findings of the previous chapter with regards to historical institutionalism and extrapolates the current trends for the future. Chapter 6 concludes the study. It summarises the main findings and relates them to the research aim and objectives. Moreover, it discusses the limitations of the chosen methodology and provides recommendations for further research.

## **2. Literature Review**

This chapter outlines the literature findings on both theoretical and empirical aspects of the topic. In the empirical section, the existing literature on the aspects of space security policy in the UK and the EU is analysed. In the theoretical section, HI is compared to two closely related, alternative theories that could be used for the analysis. The choice of HI is substantiated for this study.

### **2.1. Empirical UK and EU Space Security Evidence**

There is a large strand of literature examining the EU and UK space policies in terms of their initial development, their future perspectives and their interconnections with other policies (Hoerber and Lieberman, 2019; Bowen, 2020; Formicola, 2020; Klimburg-Witjes, 2021). Such studies have more recently started to account for security and defence issues in the convergence of civil and military space affairs. Klimburg-Witjes (2021) noted that the boundaries between military or civil applications of European space facilities and the behaviour of corresponding institutions had long been blurry. As such, we highlight two conflicting aspects of the European Space Agency (ESA). Namely, its original intention to collaboratively share resources for large-scale supranational projects in the space domain whilst accounting for space security and defence, therefore presupposing military considerations as well (Jeandesboz, 2016). McCormick (2015, p.45) notes that ESA has come to formally define,

“peaceful purposes”

as non-aggressive, instead of non-military, in a more comprehensive conceptualization of security. As space fast becomes an integrated dimension of European security that accounts for both military and non-military issues, it is increasingly difficult to distinguish between its peaceful and military aspects.

Differentiating between commercial civil and military platforms in space becomes increasingly difficult because commercial satellites are sometimes sold to military organisations whereas military forces may simply place their equipment on civilian satellites (DIA, 2019).

Gaskarth (2014) claimed that space power contributes to the development of national security, economy, and infrastructure in a sophisticated and strategic sense. Colin Gray stated emphatically that,

“no satellite system, no matter how high its orbit or sophisticated its survival aids, enjoys assured survivability. Space is not a sanctuary” (p105, 1982).

Gaskarth (2014) offered several roles the UK could potentially assume globally, from isolation by more powerful nations post-Brexit to participation in norm-promotion as a significant space power. Bowen (2018) suggests that more active cooperation with the French may be useful, but Brexit may still push Paris closer to Brussels in space, and defence generally. While geography-focused ways of thinking may suggest a particular balance of power, space is considered as a common space dominated by the US and its allies (Posen, 2003). Nevertheless, Weichert (2017) underlines how states like China and Russia are aiming not to deny America access to space, but also to dominate in this realm.

These viewpoints significantly contradict other scholars’ perceptions of the UK as an independent and important space power (Morris, 2011). What proves Britain’s current secondary role is its reduced military space capabilities in comparison to such actors as the US, China, Russia and India; although British commercial output is still substantial when compared to EU countries (Sigalas, 2017). Along with the UK Space Agency, the wider British space industry has taken a global lead in developing and exporting small satellite and ‘off-the-shelf’ satellite applications (Bowen, 2020). Further UK development in new spheres such as unmanned aircraft will also depend on space-based interactions. Without such technologies, British armed forces will not be able to communicate as freely.

## **2.2. Theoretical Evidence of EU and UK Space Security**

The author finds that nearly all existing publications on EU space policy are atheoretical. Most of them are descriptive and often resemble opinion pieces or policy reports rather than academic publications seeking to answer concrete research questions. This atheoretical stance is sometimes reflected in their titles. For example, “Carpe diem: Europe must make a genuine space policy now” (Madders & Thiebaut, 2007), or “Why Europe needs space as part of its security and defence

policy” (Kolovos, 2002). Publications on EU space policy that report positivist research with a clearly defined theoretical framework are relatively rare. One reason for this is perhaps because the policy itself is so new and outer space is only more recently re-emerging as an area of public interest. Nevertheless, Oikonomou (2017) argues that the development of the EU space policy and its Galileo and Copernicus programmes has necessitated a parallel process of policy legitimization. Oikonomou believes that policy simplification has been a core legitimising tool of the European Commission in order to achieve greater acceptability of its space policy by the general public (Oikonomou, 2017). This research study seeks therefore to fill that gap by analysing EU and UK space policies with a clear theoretical framework. In so doing, the author aims to further legitimise this field of research as the sector of space security continue to gain popularity.

To that end, the author will examine three closely related theoretical approaches that may be utilised as a theoretical framework for this study. These are approaches are historical institutionalism, sociological institutionalism and rational choice theory. The appropriateness of each approach will now be examined in depth for their relevance to the current study. Where possible, the author shall highlight existing relevant literature in the realm of space and EU policy that pertains to each approach.

### **2.2.1. Conceptual HI Evidence in EU Policy**

The author notes a strand of literature which is dedicated to HI within different domains such as European integration (Pierson, 1996; Ioannou et al., 2015), European sustainable energy transitions (Lockwood et al., 2017) EU security and defence policies (Kalligas, 2006; Dewar, 2017) and the financial aspects of the EU defence policy (Hristov, 2019). Kalligas (2006) used the HI framework to explore EU defence policy and argued that in line with path dependence, as the EU had pursued the integration of its military and defence efforts, it would now be difficult to deviate from this established path.

Broader HI conceptual analysis of EU policies appear in the existing literature but such analysis is scarce within EU space security policy, however. A particular analysis by Sigalas (2017) is therefore of special significance to the current study as he



analysed European space policy in light of HI. The main conclusion of his study was that HI is suitable for explaining the further development of the European space policy (ESP). His study is lacking, however, as he does not mention certain critical junctures and he does not examine UK space policy in any detail. This study could therefore address both of these limitations.

In terms of HI, Sigalas (2017) claims that the elaboration of the EU space policy was not purely accidental neither was it completely and thoroughly planned. In an earlier work (2012), he argued that the ESP started as an entirely intergovernmental work, but gradually acquired the supranational aspect within the EP. The EC and other EU institutions have since been hugely influential in its promotion of space-related activities, ranging from scientific research, developments in the spheres of environment and security, terrestrial telecommunications and satellite-driven navigation (von der Dunk, 2010). This growth assisted the ultimate implementation of global space projects such as Galileo and Copernicus which also follow HI's concepts of increasing returns and path dependence. For Galileo, the perceived advantages of the PPP structure were emphasised such as the programme's value for money, its claimed gains in efficiency and the abilities of Galileo to make a future profit. Secondly, a security frame emphasised independence in satellite navigation and the potential for the military use of Galileo PRS signals (Hoerber and Stephenson, 2015).

That said, some events could not have been predicted but have still greatly influenced ESP development. Sigalas (2017) highlights disruptions to space infrastructure during the Kosovo conflict, examined in Chapter 4 of this study. During the Balkan Wars, the US military blocked civilian GPS signals, which caused massive disruptions to civilian aviation services (Jones, 2007). Communication problems during the Kosovo crisis ultimately convinced the European supranational authorities of the need to construct an autonomous satellite navigation system. This event had long-lasting consequences which shall be explored later in the study. Another example of such a juncture is the failure of the Galileo public-private partnership programme which led to the transfer of full control and responsibility for the project to the EU (Sigalas, 2017).

### 2.3. Analysis of Historical Institutionalism

The following sections of this literature review will compare HI with the adjacent disciplines of SI and RCT to justify its use in this study's analysis of the UK-EU relationship in the sphere of space security. Historical institutionalists have developed two almost contradictory concepts of institutions (Fioretos, 2011). The first strand of research deems institutions as *structures* that are common and enduring models of social organisations at the state level. They are stable in the long term and thus usually determine more specific patterns of political and social acting. For example, after the fall of Communism, administrative reform in former communist states has been indicative of the establishment of the institutional structures needed for EU accession (Georgescu, 2014).

The second strand of HI research considers institutions as *processes*, that is, particular regulations, policies and procedures that are considered to be less stable than the latter and often change over time (Thoenig, 2011). Similarly, Pierson (1998) suggested that HI is "historical" since it posits political development as a comparatively open-ended process where institutions are not immobile constructions, but more flexible formations (Hobsbawm, 2009). It is institutionalist as the factors of this development are mostly determined by institutions that may emerge in the form of formal rules, cultural or social norms and policy structures.

The earlier macro-sociological approach reflected in the works of Tilly and Ardant (1975), Skocpol (1979), and Rokkan (1999) would be clearly defined as 'historical institutionalist' today. In contrast to Marxism that mainly focused on class struggle and its influence on social structure, macro-sociologists tried to explain historical events by other cultural factors (Inglehart and Baker, 2000). These works focused on the role of structure, primarily investigating how structural factors in various settings caused combinations of phenomena to occur within different societies.

HI emerged as a continuation of the macro-historical tradition of social research, which appeared under pressure from the quantitative and statistically oriented social sciences and theories of rational choice most applicable at the micro-level. Disputes between these parties led to the development of HI principles as an

approach that would combine the focus on institutions and a reflection of changes over time (Steinmo et al., 1992).

Other trends in social research called attention to the potential for changes over time. Steinmo et al. (1992) claim that the interaction between political strategies and institutional settings is dynamic rather than constant. Formal rules are often not the same as the institutional rules actually in use within networks. Formal decisions may break down institutional practices, change commonly held outlooks or liquidize whole organizations (Klijn and Koppenjan, 2006). Steinmo et al. (1992) contend that actors may tend towards currently available opportunities and in so doing, influence institutional decision-making. This is in contrast to rational choice theory which considers institutions as structures that either generate equilibrium or even constitute that equilibrium themselves. HI theorists likely justify deviations from equilibrium by assuming that constant changes do not allow static system states to be sustainable over the long term and that there is no certain end point to such changes.

That being the case, HI has been challenged to formulate theories that adequately reflect the connections between structure and process more precisely. Initial efforts attempted to employ provide explanations from economics, but not from game theory or equilibria studies. Pierson (2000) examined mathematical reasonings in an attempt to connect structure and process more completely but Irish economist Brian Arthur moved further (1994) to suggest a means of accounting for institutional change through the concept of path dependence. He assumed that individuals' choices are determined by their previous actions. This suggests finding a tipping point - a well-defined event that caused overwhelming political movement in a certain direction (Marten, 2018). Arthur (1994) utilised *Polya urn processes* to simulate change over time to support previous research which claimed that actors, given free choice, would inevitably reach a state of equilibrium as a result. His research showed that even though social systems initially suggest different outcomes, they eventually tended to unanimously conform.

According to Gould and Eldredge (1977), this path dependence concept allowed HI to better explain how history matters. They determined that chances for institutional change are strictly limited by initial, often random choices which they

view as similar to these '*Polya urn processes*' which also later restrict opportunities for change. For Krasner (1982), path dependence reinforced the notion that institutional change was a result of 'periodic equilibria' when periods of stability and adherence to particular institutional settings are interspersed with concise accidental moments that provide opportunities for change (Krasner, 1982). These moments might even be associated with the collapse of existing institutions and the formulation of replacements (Krasner, 1982). This supports the notions of stability and continuity in policy through a historically substantiated argument for institutional development but also the possibility of change due to historical bifurcation (Olsen, 2010).

While it may seem that path dependence is only a causal relationship between a reason or event and its consequences, the association is more complicated. Levi (1997) and Pierson (2000) compare path dependence to climbing a tree with several trunks. Choosing to climb a particular trunk implies a causal relationship. The choice of climbing a certain trunk automatically removes opportunities to use branches on other trunks. For Sigalas (2017) this implies that it is easier for HI to explain institutional origins and past growth processes rather than to predict their further development. North (1990) also refused to consider path dependence as a deterministic process. Critical junctures that affect path dependence can also ultimately redirect initially designed processes towards unpredictable results. The deterministic element of path dependence generally develops in line with the logic of increasing returns, however (Sydow et al., 2020). Drawing on HI, Gstöhl and Phinnemore (2021) postulate that the UK's future partnership with the EU post-Brexit is likely to be influenced by established practices of EU relations with its European neighbours than by any sense of privilege coming from the UK's former position as a member state. EU Policymakers may find themselves in a 'lock-in' situation when it is near impossible or too costly to abolish their established practices and restore initial pre-decision conditions in such a scenario.

Mahoney and Schensul (2006) focused on historical lock-in, self-replicating sequences and reactive sequences as concepts of HI. Historical lock-in implies that there may be events and actors in history that cannot escape from a particular historical route and can only follow a predetermined path resulting in inescapable

consequences. In the area of asylum, lock-in has stalled integration within EU policy whilst reactive sequencing has accelerated external border security. This differentiation leaves EU migration policy unbalanced and uncoordinated in crisis (Schilde and Goodman, 2021). Two types of subsequent events from historical lock-ins are possible. First, self-replicating sequences are results that do not develop or evolve but rather repeat infinitely over time, thus, reaching an equilibrium. Secondly, reactive sequences are both a response to prior events and a catalyst for subsequent events, and thus represent,

“chains of temporally ordered and causally connected events”

(Mahoney and Schensul, 2006, p.467). Collier and Munck (2017, p. 7) noted that a ‘legacy is an enduring, self-perpetuating institutional inheritance of the critical juncture that persists and is stable for a substantial period. Morrow (2013, p.157) explored self-replicating legacy dynamics in Northern Ireland. The equilibrium achieved here is one he describes as the alignment of violence and ethics into a ‘logical death spiral.’

On the other hand, path-dependence theories have issues in clarifying institutional change as it uses critical junctures to explain changes as the outcome of purely exogenous factors. Institutions are capable of changing radically under the influence of purely internal factors instead (Graftstein, 1994). Bickerton et al. (2011) assumed potential internal drivers in EU policy to include some government leadership (especially that of France), the need to rationalize the existence of the European defence industry, and habits of cooperation that developed between Europeans within bodies such as NATO and the WEU. What is noteworthy here is that these transformational internal drivers are neither rapid nor random but gradual and consistent. This contradicts path dependence principles as it assumes the quick formation and stabilisation of paths after a period of ambiguity. Path dependence proposes no certain theory to adequately explain how internal mechanisms of institutions changed or replicated themselves, therefore (Thelen, 1999). This ultimatum has forced some HIs to suggest that such gradual institutional changes lead to significant points of historical transformation (Streeck and Thelen, 2005).

These contradictions made researchers elaborate upon new ideas to understand how institutions transform and reproduce. This shift of HIs' focus from the exploration of the institutions themselves to the mechanisms of their transformation has led to a certain ignorance of some issues. Vinsel and Russell (2020) stress that innovation is radically overvalued. They argue that what happens after innovation such as the maintenance and repair of infrastructures is far more impactful than most innovations. Schmidt (2012) argued that since the main focus of HI shifted to investigate the role of the agent and their strategies, the significance of smaller incremental innovations might also be overvalued whilst essential changes that involve larger institutional outcomes may instead be overlooked.

Finally, HI discourse sometimes fails to succinctly explain the role of institutions themselves and how this is distinct from more transient actions determined *by* institutions, such as policies. HIs shift from considering institutions as rigid structures with visible outcomes, to its focus on *agents'* actions and considering institutions as processes instead, does not explain how institutions determine political outcomes or why subsequent changes occur in society. This may not even be a problem of HI alone but instead may be an issue for all social institutionalism sciences.

### **2.2.1. Competing Theories**

Among the theories that most closely compete with HI in explaining the essence and role of institutions in society were rational choice theory (RCT) and sociological institutionalism (SI) (Nilsson, 2018; Zey, 1998). Although they are both capable of providing useful insights in the field of this study, this literature review also reflects on their limitations that make the use of these theories unfeasible for this research.

### **2.2.2. Rational Choice Theory**

Unlike HI, Rational Choice Theory (RCT) considers institutions mainly from the viewpoint of equilibrium that actors are not incentivised to disrupt unless other actors do so first. Actors would be motivated to not violate this equilibrium and would likely start acting only after another actor makes the first move and violates equilibrium. Hoerber and Lieberman (2019) argued that recent efforts to establish a

single European space policy may be an attempt to rationalize the process, even though this debate remains contested between ESA and the EU. Della Liberta and Viminario-Padova (2018) considered the logic of military cooperation within the European PeSCo from an RCT perspective and argued that it more easily allows integration with other sub-fields of the defence framework, such as homeland security and industry. In other words, this deal potentially enlarges the scope of joint activities and expands cooperation into other policy areas.

McKelvey (1976, 1979) and Schofield (1978) alternatively claimed that the stability of political outcomes would depend on the number of explored dimensions and that more than two dimensions would lead to instability. Their empirical observations evidenced that stability was attainable. The root factor of this stability is now considered to be institutions themselves. As Peter Praet, (2019) Executive Board Member of the European Central Bank argued, institutions provide stability in our increasingly uncertain world by their very nature of durability.

Shepsle (1979) offered the example of US congress committees where structured institutional arrangements helped turn a chaotic space of potential social choices into a series of iterations and ultimately into decisions that were later implemented. Scholars then started to use non-cooperative game theory instead of social choice theory to represent this decision-making process in the form of 'game trees' where individual decisions could lead to the establishment of equilibria (Osborne, 2004).

This strand of research evolved from the puzzle of why individual actors' choices not only contradicted RCT but were also persistent over time (van Benthem, 2002). A second puzzle for RCT questioned the determinants of stability and the causes of deviations from consistent development (North, 1990). Development studies of the 1980s -1990s argued that a free market with minimum possible control from the government was important to develop strong markets. RCT claimed that all countries would undertake similarly effective measures and thus it imagined growth that would converge at a certain rate. In reality, countries continued to choose entirely distinct growth strategies even in the presence of political freedom and market strength (Streeck and Thelen, 2005).

North (1990) suggested that the explanation for this behaviour from the perspective of RCT may be in the set of rules between institutions and organisations that form the incentives for a particular country. Societies, where institutions stimulate organisations to grow, promote long-term development where institutions and organisations support and reinforce each other. Meanwhile, societies that encourage short-term predatory and egoistic motives follow a low-growth unincentivized path since the involved institutions and other state actors do not have corresponding mechanisms to stimulate growth (North, 1990). Riker's (1980) main criticism towards structure-induced equilibrium models of institutionalism was that they could not be the solution to a social instability problem as they were a product of the multiple choices of different actors. As such, they were also subject to the instability they were intended to resolve.

North's (1990) arguments also appear inconsistent for the following considerations. At times, he seems to claim that actors' choices at the micro-level were determined only by their aspiration to gain benefits for themselves regardless of the effect on others. At other times, he opines that actors' choices are directed towards gaining efficient institutional arrangements. These two statements appear contradictory because, at the micro-level, the binding power of institutions is in their ability to generate benefits for particular actors only whereas the second consideration claims that good outcomes should be equally gained for all involved actors. This shifting between frameworks without an adequate set of assumptions appears unconvincing.

Later, equilibrium institution models considered institutions as the final product of *games*, but not as the actual structure of a game as before. Therefore, they explored social interactions as games that instead had comparatively simple structures but with large numbers of iterations, instead (Calvert, 1995). Napel and Widgrén (2006) describe the interactions between the EP, the European Commission and the European Committee of Ministers as an extensive form game and that bargaining power in the proceedings. A problem of these equilibrium institutions models was that they mostly produced a large number of feasible equilibria and types of possible institutions however these models did not reflect how institutions developed or changed over time.



The investigation using North's (1990) approach was continued by other researchers. Greif (1994) used a similar framework to indicate distinctions in choices by medieval traders from Genoa and The Maghreb by considering them as actors in a *Prisoner's dilemma* game. He worked to understand how the choices in different cultures produced different sets of regulations and then different self-reinforcing institutions as a result. Milgrom et al. (1990) utilised a similar approach to understand how regulations at the Champagne trade Fairs developed in medieval France.

Although these types of models helped to provide insights into behavioural differences based upon varying initial assumptions and settings, these and similar models still did not reflect the differences between institutions and actors' behaviour, nor did they provide certainty on when institutions might experience substantial change. Calvert's (1995) explanation, as previously discussed, more specifically did not differentiate between actors' strategic behaviour, the organisation in pursuit of its goals and the institution to explain the outcome of an interaction. This is perhaps because they all could be considered as types of actor behaviour in effect, caused by speculations on the behaviour of others. Folescu (2016) notes that for the EU, policies are only generally agreed upon if the outcomes are more attractive than no settled agreements. She admits though that those policymaking competencies placed exclusively at the EU level are closer to sociological institutionalism in design. This is because supranational legitimacy depends on shared beliefs in the authority of technocrats and the law to realise shared values and norms. Greif and Laitin (2004) presented institutions as entities that involve combinations of factors that both induce and affect behaviour but are not classed as a *behaviour* in themselves. However, they did not explain how exactly these factors or elements supposedly interact. Their definition of institutions was rather too broad, so it was challenging to indicate their boundaries or understand what was to be classed as an institution, or not. This again highlights the problem of using equilibrium-implied models to adequately explain institutional change.

Acemoglu et al.'s (2001) pioneering methodological approach suggested using instrumental variables to prove that it was institutional formation and development that triggered further economic growth of societies (Przeworski, 2004). Acemoglu and Robinson (2006) showed how an authoritarian regime might change to a

democracy; claiming that this change would occur through negotiating processes and the resolution of social conflicts. Farrell (2018) recently propositioned that while this approach could explain the shift from one well-defined political system to another; it would fail to adequately explain the transition between more open-ended systems or more gradual transformations.

Levi (2013) also disagreed with Acemoglu and Robinson's (2006) aforementioned study by claiming that while these authors appeared to argue that the process of forming political and economic institutions was due to interactions between coalitions and interest groups, according to Levi (2013), they did not satisfactorily explain how these groups had first appeared or how they then receive power. That is, Levi (2013) argued that these researchers merely made the assumption that these groups existed and gradually evolved which again does not allow for answering the same root question.

### **2.2.3. Sociological Institutionalism**

Compared to HI, the sociological perspective defines institutions in a broader context. Along with formal rules and procedures peculiar to HI, Sociological Institutionalism (SI) also comprises symbols, as well as cognitive and moral schemata (Farrell, 2018). According to this approach, institutions construct frameworks of meaning which determine human behaviour, and because of this, institutions are similar to cultural systems. Thus, institutionalisation here implies the modelling of meanings that individuals can give to events and actions. These *created myths* that are then supposed to fulfil formal structures, become key for fully explaining the relationships between their elements (Meyer and Rowan, 1977). Not only do they influence administrators' decisions and actions, but also according to SI, they will also determine the range of solutions and action models of the actors. The individual did not exist separately from society but was formed by the scripts in use by it. Thus, it is society or culture at large that determines the composition and the values of the public sector, as well as what actions can and cannot be done.

SI is based on the viewpoint that institutions are organising such myths (Kostova et al., 2008). This reveals the difference made between the institutions and the behaviour that they induce, as people's actions are distinct from the myths that

substantiate their behaviours. However, SI has faced significant difficulties in explaining institutional change since SI theorists have mostly been interested in explaining consistency and continuity of processes rather than tipping points and subsequent dramatic changes.

SI is also of questionable validity within the context of EU space policy because it does not explain the emergence of certain frames over others. For example, as Oikonomou (2016) points out, SI cannot explain the industrial preferences by the Commission in its space policy as an outcome of the dominance of a pro-market, pro-industrial frame within the Commission as a whole. The very source of frames, their origins and how they relate to power sources to become prominent is not well defined by SI.

One alternative line of SI research, however, continues Weber's (1978) idea of the *Iron Cage* of rationalisation (Gerth and Mills, 2009). Weber (1978) dispelled these myths and prophecies by replacing them with the rationality of bureaucratism and organisational efficiency. As a result, the world was predicted to become more homogenous. Whilst DiMaggio and Powell (1983) agreed with forthcoming homogeneity, they claimed that the determinants of this process would not as such be those forecasted by Weber (1978). Instead, DiMaggio and Powell (1983) suggested that rationalisation was determined by isomorphism- that is, the inclination of organisations to copy the seemingly effective actions of others and in so doing, converge to a standardised range of practices and methods.

Some researchers (Ostrom, 1995; Clemens and Cook, 1999) attempted to indicate the processes that allowed institutions to come into being and further transform. This strand of literature considers institutions as a cultural phenomenon. This implied that institutions were important not because they compel for particular actions or provide information, but because they helped people to look at and understand themselves and other people and comprehend relationships between them (Ostrom, 1995). Clemens and Cook (1999) suggested that this allowed for considering institutions as a long-lasting constraint as they were capable to constrain political behaviour and policy diversity and thus limit the processes of conflict between different parties and innovation that are key in politics. Fligstein and McAdam (2012) opined that most actors normally do not create rules but only follow

them, either consciously by replicating others' actions or being compelled, or unconsciously by following unwritten rules.

SI has tried to address this issue of process limitations rather than relying on the desirable outcomes of human agency and agreements. Clemens and Cook (1999) claimed that institutions themselves can be deemed either as *limitations* or as *guiding regulations*. They contend that the combination of these two traits may most easily explain institutional durability. They also noted that institutions may include cultural elements such as algorithms of thinking about the world, which may generate opportunities for institutional change. Clemens and Cook (1999) also underscored heterogeneity of standpoints, network dissociation and conflicts between institutional rules as important factors in explaining the conditions under which institutional change is more or less probable to occur. However, these particular notions failed to provide common explanations partly because the theoretical ideas they triggered were often peculiar to certain situations and could not be generalised. Concepts such as skilled social action and robust action could be highly effective to describe existing coalitions and the conditions of their formation (Ollis, 2011), but they do not generally allow for developing new propositions that could be then tested empirically. Social skill cannot be explained so clearly and directly; it can only generally be seen through its outcomes and consequences (Mayo, 2005).

The second set of issues for SI is in showing off its effects in real life. Schneiberg and Clemens (2006, p.201) inquired about the,

“substantive implications of institutional effects”.

While the authors noted that a significant body of literature attempted to identify significant consequences, two challenges remained unaddressed. First, the research did not explain thoroughly the specific mechanisms of operation of institutions. The authors asserted that all visible cultural effects were attributed to the impact of higher-order institutions instead of trying to explain them through other mechanisms. Second, as it overestimates the structuring ability of institutions, it ignores heterogeneity and diversity of viewpoints on institutions. This not only means that SI's viewpoint on institutions is one-sided, but its estimation of

institutional effects is over-totalizing. As different researchers and people, in general, have different views and attitudes to institutions, the issue of the nature and effects of institutions looks to be not so unambiguous as SIs suggest.

### **2.3.1. The Choice of HI as Theoretical Perspective for this Research**

The author found that publications on EU space policy with a clearly defined theoretical framework are rare. One reason for this may be the recentness of the sector's development as an area of public interest. The author argues that the development of an EU space policy is nonetheless a politicized process that is expressed ideationally, to increase legitimization. It is not a spontaneous result but a deliberate set of actions by its policy actors - namely, the Commission, the industrial leaders and academic experts - to reach a consensus. The popularization of space in the EU is not politically neutral, instead, it requires supranational cohesion over costly and controversial projects such as Galileo and Copernicus. That being the case, analysing EU and UK space policies through a theoretical lens adds legitimacy to this complex policy area. This research study seeks therefore to fill the observed literature gap by analysing EU and UK space policies through the lens of a clear theoretical framework. In so doing, the author aims to further legitimise this field of research as the space sector gains popularity.

The analysis of historical institutionalism, sociological institutionalism and rational choice theory has highlighted the advantages and disadvantages of each. The choice of HI appears to be the most relevant for the present study. HI explores institutions as both processes and structures which allows for development over time to be examined and indications of dramatic changes in institutional settings. While both the RCT and SI have considerations similar to the path dependence concept, they look unable to capture changes along two dimensions, namely structural breaks and temporal changes. Representing institutions as structures can also allow us to reflect on exactly how change influences institutions. The concept of path dependence allows for tracing changes and also attempts to explain whether they are a natural consequence of current conditions.

The inclination of RCT to explore all changes from the viewpoint of equilibria fails to explain the formation of institutions and thus how they came to those states of

equilibria. The RCT was indeed shown to perform poorly in the conditions of uncertainty. Meanwhile, today's world is becoming increasingly uncertain and ambiguous so that it becomes harder to build equilibria models that account for multiple factors.

As for SI, its commitment to interpreting institutions as social and cultural myths rather than solid structures fails to coherently explain state policies. This is because, under SI, state policies are not the products of social agreements and traditions *per se*, but rather the outcome of more serious, formal work in the fields of law, politics and economics. For the purposes of this study, under SI, these more formal outputs are then used to account for potential consequences of decisions in the sphere of space but also to avoid the likelihood of serious problems occurring. Moreover, the analysis of the literature showed that SI is more focused on describing the institutions themselves rather than reflecting on institutional change. That being the case, it fails to capture the temporal aspect of changes. Bearing all these factors in mind, HI looks to be the most relevant theory for explaining the evolution of space defence policies and also the relationships between the EU and the UK in this sphere.

This study shall examine more critical junctures than Sigalas (2017) in his analysis of EU Space policy through the perspective of historical institutionalism. In particular, this research highlights more junctures that occurred during the development phases of the EU space security policy and more greatly expands upon their consequences. Moreover, this study shall explore the historical development of the UK space security policy from a similar institutionalist perspective where Sigalas did not.

### **3. Methodology**

This chapter outlines the methodology of the study. First, the research design is formulated. It indicates the philosophical stance, the type of research and the research strategies employed. Also, the data sources are defended. Finally, the research method is explained.

#### **3.1. Research Design**

The research is conducted in line with the philosophy of interpretivism. Interpretivism is opposite to positivism in its perception of analysed reality. Positivism assumes that there is single objective knowledge that does not depend on the researcher and can be replicated by different scholars. The main postulate of this philosophic stance is that the reality and knowledge about it do not depend on the scholar who conducts the research. In this sense, positivism exploring social sciences resembles the exploration of natural sciences such as chemistry and physics where experiments have to be replicable and produce the same results. Thus, the object and subject of the research have to be separated so that the results of the research stay independent of the researcher.

On the contrary, interpretivism pays significant attention to individual interpretation of the studied phenomena. It does not separate the object and subject and posits that different researchers may come to different conclusions given the same observations. This is because researchers will have distinct life experience, expertise and attitude to the phenomena which form a kind of a “lens” through which researchers look at the object.

The philosophic stance of interpretivism also justifies the use of a qualitative research design in this study. Unlike quantitative research which is often based on mathematical and statistical methods, qualitative research aims to obtain a greater depth of insights into the topic. Whilst quantitative research mostly tests formulated hypotheses and then only estimates the significance of the explored relationships, qualitative research aims to test the complexity of the relationships and their potential roots rather than just the statistical significance. In quantitative research, the researcher only estimates the significance of explored linkages through the use

of existing theory, but qualitative studies can explore all available data on a topic to reveal relationships between meaningful factors or chunks of data.

Qualitative research can employ both primary and secondary data. The collection of primary data in this study would have been useful to more adequately reflect the attitudes of relevant respondents to the explored object. However, it was a more time-consuming process to collect such data. Other primary data, such as the limited legislation on space were not the prime focus of this study. Moreover, since the study explores the UK-EU space defence partnership, it would be difficult to contact relevant experts in the field to obtain the required information. Therefore, secondary data was employed in the study. A specific trait of secondary data is that the process of its collection and refinement has already been done. On the other hand, it may not suit the aims of the research so the analysis based on the secondary data may appear to be less efficient and productive.

The use of qualitative data is mostly connected with the inductive approach to the research that is opposite to the deductive approach. The latter implies that there is an already formulated and generalised theory based on previous findings in a particular sphere and the research aims to examine this theory in a new context. That is, the researcher applying the deductive approach takes a general proposition and tests it in a particular narrow context. If the results confirm the theory, this implies that it is broadened to a new context. If not, the theory should be revised and amendments made. The inductive approach meanwhile implies a movement in the opposite direction, that is from the particular to the common. The researcher collects facts and data but has no clear vision of trends at the outset. Once the data is collected, structured and analysed, the researcher can then make conclusions on the most significant trends in the data and thus generate new knowledge about the object. When sufficient evidence is collected, a new theory that generalises said data is formulated.

The present study is not directed at inductively formulating a new theory, but rather, it explores the past EU-UK relationships in the sphere of space defence within the particular framework of historical institutionalism. This is designed to allow the researcher to deduce and generate new insights and forecasts on how the current



processes within this sphere of defence may be extrapolated and understood for the future.

### **3.2. Data**

The study utilises secondary data. Because of the added difficulty of obtaining primary data in the form of surveys or interviews due to the restrictions brought about by the Covid-9 pandemic, the author, therefore, has decided to use secondary data sources mostly from open sources such as academic journals and textbooks and official government policies, reports and strategic plans. The data is qualitative and is represented mainly by text. In particular, the data used in the analysis include academic sources exploring the concepts employed in the study.

These include the HI, the theory of space power, supranationalism and intergovernmentalism in the space sphere. Along with that, official documents utilised in the research include UK and EU space strategies, reviews of the state of affairs for different periods as well as agreements on a partnership between the two sides in the sphere of space defence.

### **3.3. Research Methods**

The qualitative secondary data is analysed in this study using thematic and narrative analysis. This means that the information collected from different sources is examined and verified to formulate a particular perspective on the research question. The use of numerous academic sources and official documents of data stipulates that triangulation has to be gained which implies verification of information (Moustakas, 1994).

Saunders et al. (2015) distinguished between three main types of operations with data in qualitative analysis. These include (i) summarising meanings, by the aggregation of the broadest possible information and highlighting its key points; (ii) categorisation of meanings through the development of categories and allocating meaningful chunks of data to those categories; and (iii) the structuring of meanings using narrative analysis if fragmenting data is inappropriate, but a holistic and consistent view on the data is still required.

The first two operations look to be the least appropriate in light of the current research aims. The relationships and partnership between the UK and the EU in the sphere of space defence are better analysed in continuity to highlight the trends and to forecast possible future scenarios. Therefore, narrative analysis is used in this study.

### **3.3.1. Narrative Analysis**

Narrative analysis implies that the integrity of the collected data should be retained so that complete sets of information are utilised in the investigation. Narrative analysis uses the individual's perceptions of their own experiences and the social phenomena around them by way of aggregating their subjective interpretations to explain the world they live in. Although Saunders et al. (2015) note that the main source of data for narrative analysis is in-depth interviews with participants of events or individuals who can provide meaningful information about the explored object, it is more important that a sufficient amount of information is collected, and its analysis and interpretation of findings are conducted. Importantly, collected information should be presented in a sequenced way showing a set of related events and structured to form a consistent story that is meaningful and provides answers to the research questions (Coffey and Atkinson, 1996). Whilst narrative analysis has included phenomenological research (Moustakas, 1994) and analysis of life history (Musson, 2004), Kim (2016) provided another classification. He distinguished between three types of analysis- narratives of self, including life history analysis (English, 2006), then narratives and society that examine the story of phenomena at the cultural or state level and finally and finally narratives for social justice (Wolgemuth and Agosto, 2019).

A narrative and society analysis focuses on social phenomena often within institutional contexts. Clandinin and Connelly (2000) refer to narrative analysis as the examination of lived experience in formal settings such as organisations and schools. They employed ethnographic methods to obtain and collect data using methods such as observations, interviews, making notes and journaling among others to reflect the experience. Since the space defence partnership is studied within the HI context in this study, methods of collecting information on personal experience such as interviews could be useful. This research nevertheless focuses on the

institutional foundations of this EU-UK interaction; therefore, the use of official documents and literature appears to be more appropriate. Boje (2001) explored organisational communication as a social practice. Although he focused on informal communication within organisations as the research object, his study is useful as it shows that formal organisations can also be analysed using narrative analysis.

Saunders et al. (2015) suggest that aside from reflecting the attitudes and feelings of respondents, narrative analysis can also be conducted for building a coherent story from available data which is the case in the present study. Since a consistent story is expected to be formed in this research, narrative analysis is also more preferable to the methods of fragmenting and coding information. These restrict the temporal presentation of information as they tend to present a portion of available data but remain unable to adequately reflect connections over time (Kvale, 1996). In this case, the researcher's viewpoint on the explored events and their interpretation of the collected data act as a foundation for storytelling instead of grouping and coding the data.

Along with indicating temporal relationships and constructing a consistent story from events, their social significance and organisational context have to be retained while ignorance of these aspects might make the constructed story subjective and biased. Therefore, it is important to maintain a balance between the researcher's perception of the data and its interpretation with a degree of objectivism to consistently represent the data.

Narrative analysis representing a story with a beginning, middle and end typically has a tangible structure. Coffey and Atkinson (1996) listed the main elements of such a story that comprise the structure of the narrative. These include:

- What is the story about? It shows the object of the analysis and its place within broader contexts.
- What happened, to whom and why? This element represents the sequence of events and the current state of affairs.
- The significance of the explored events. This shows how the events affect broader contexts and what consequences may occur.

- The outcomes of the story arising from the abovementioned events. This element concludes the analysis by showing what has already happened as a result of the explored event and what might happen in the future.

These are some of the questions and areas that shall be later examined in the analysis of this study. The author applied these questions to order the chronology of the events, to further explore the context of the UK, US and Europe, the significance of past decisions and how they led to the present state of space security policies. Coffey and Atkinson (1996) argue that it is not necessary that all elements are present in the study in the exact order or that all of them have to be present.

### **3.3.2. Thematic Analysis**

Along with narrative analysis to construct a holistic and consistent story from the available data, thematic analysis is also utilised in the study. While different classifications reflect the relationship between narrative and thematic analytical methods (Mishler, 1995), Riessman (2005) considers thematic analysis to be a model within narrative analysis along with structural analysis, interactive analysis and performance analysis. While the latter two types mostly refer to individual or group behaviours, structural analysis is understood in the same way as Saunders et al. (2015) in terms of using data within different operations, as previously discussed (2015).

Thematic analysis mostly concentrates not on constructing an integral story that unfolds over time, but on noticeable trends and topics across the available information and apparent relationships between them. This method is connected to an interpretation of events, as the amount of information available to the researcher depends on the depth of the search and attitudes to the information. The classification by Riessman (2005), that thematic analysis is a model within a narrative analysis, at first appears to be inappropriate because narrative analysis and thematic analysis take different approaches to the research data. Using these two approaches separately might produce cardinaly different outcomes. However, their combined use allows for the exploration of data in two dimensions at once, with narrative analysis being “responsible” for the temporal dimension or depth,

and thematic analysis concentrating on the “width” of the research without binding data to time.

Braun and Clarke (2006) suggested creating data themes or patterns as the outcomes of thematic analysis. While they can be further categorised to create subcategories and subthemes, this is not the aim of the present study (Vaismoradi et al., 2013; 2016). What is more important, the decision to clarify each category by deepening the research in a particular dimension depends on study aims and the researcher’s incentives (Bengtsson, 2016). As this research aims to trace the development of the EU-UK relationships in the sphere of space defence within the HI context, one of the objectives is to examine the path dependence concept using real-life data. Therefore, thematic analysis is used to outline a set of topics or themes which are explored in the study while the role of narrative analysis is used to allow for elaborating on these themes over time.

“Theme” can be considered as a meaning that repeats across explored data and is either a contextualised message of the data or perceived by the researcher as important. It is a common topic for describing frequently observed meanings allowing for the matching together similar pieces of data using which a scholar can answer the question “why is it so?” (Erlingsson and Brysiewicz, 2013). A code is a narrower concept that describes a particular meaning whereas a set of similar codes comprises a theme.

## **4. Analysis**

This chapter will cover the findings and the analysis of the research. In particular, it reflects on how UK and EU space defence policies have evolved and the origins of particular decisions and events that have had lasting consequences. Moreover, it shows the intersection and divergence of the UK and EU paths in terms of their space policies. It concludes by indicating the three phases of space defence development.

### **4.1. UK Space Policy**

The development of the UK's space programme was shaped by its relationships with other world political powers and arguably its interactions in the sphere of space defence were key to its broader political relationships in general. Churchill's famous post-war 1946 'Sinews of Peace' speech was potentially a critical juncture for the UK that determined the developmental direction of post-war Britain and its future behaviours with regards to space affairs. In this speech, he praised the US, with whom the British Empire and the Commonwealth had a "special relationship" (Bennett, 2021). He also outlined three important and overlapping directions of Britain's foreign politics, namely the British-American, British-Commonwealth and British-Western European relationships (Peden, 2007). In terms of the space industry, this triad of relationship has transformed over time as the British-Commonwealth association has been replaced by the vector of the UK's independent space policy.

While in the first post-war decade the UK had imperial ambitions, it became an ordinary albeit influential member of the European Communities (Butler, 2016). The start of the Cold War played to British strengths as a major military power when it had lost economic authority on a global scale (Clarke, 1998). After the defeat of Nazi Germany in the Second World War, the UK was the leading European country in the space industry. The industrial titans of Japan and Germany had not yet recovered from devastating military defeats during the war and posed no immediate threat (Comfort, 2012). Before the creation of NASA in 1958, the US had hoped that the UK would be the next state to launch a satellite to demonstrate the West's strength in space. Most certainly, the UK's technical developments suggested it could do so (Millard, 2018). They had developed solid-fuel guided rockets during the war and

launched three ballistic V-2 missiles which they had captured from the Germans in 1945 (Kennedy, 1983). In 1946, the UK and Australian governments signed an agreement to build a launching range in Woomera, South Australia (Morton, 1989). Expansion grew in the 1950s, with the establishment of The British National Committee for Space Research in 1958. The same year, the UK launched Skylark missiles from Woomera, deepened contacts with American space scholars and participated in the International Geophysical Year which all gave the UK space science community a strong boost (Krige and Russo, 2000). Despite this, a range of authors including Weiner (2004) and Rubinstein (2015) claimed that Britain was still out of date and that it was participating in

“vain, unnecessary projects” only to bolster its image as a large power and “keep up with the Joneses” (Rose and Rose, 1969, p.77)

which wasted precious resources made even scarcer by the war (Heinlein, 2002).

Further development of the UK space science industry can be characterised by the deep relationship between the UK and the USA. London has historically been tightly connected to US space infrastructure due to its partnerships with the American nuclear sector and US scholar communities that participate heavily in space technology (Aldrich, 2010). The 1958 US-UK Mutual Defence Agreement on nuclear weapon cooperation was by far the most comprehensive bilateral treaty<sup>4</sup> of its kind at the time (Baylis, 1995). Baylis argued that this special relationship was mutually beneficial but it was never equal, given the might of the US both economically and militarily compared to the UK. He believed that the UK soon became dependent on the United States for nuclear weaponry because Britain lacked the resources to produce its designs independently.

The first missile developed in post-war Europe was Blue Streak, the brainchild of a collaboration between the UK military industry and US engineers. Being an intermediate-range ballistic missile, it was intended to become a supplementary European part of the American intercontinental ballistic missile system (Krige and

---

<sup>4</sup> British Prime Minister, Harold Macmillan called this agreement ‘the Great Prize’ because of its high strategic value to the United Kingdom. See Macmillan, H., 1965. *Riding the Storm, 1956-59*. London, 1971. *Tides of Fortune, 1945-1955*.

Russo, 2000). However, calculations later confirmed that Blue Streak was unable to counter Soviet missiles due to inadequate range capabilities (Harvey, 2003) and the program was cancelled in 1960 (Krige and Russo, 2000). This is another critical juncture in the UK's space history. At this stage, the British authorities understood that the country would be unable to implement its desired space projects and programmes alone and that collaboration with other space states was necessary. Permanent budget limitations did not allow the UK to remain at the forefront of space research as an independent power.

The UK government was not ready to dismiss their £80m investment into Blue Streak, which translates to £1.5bn after inflation (Hill, 2001). They decided therefore to repurpose the cancelled missile into a three-stage satellite launcher that could place a one-ton payload within low Earth orbit (Sheehan, 2007). To reduce the costs of the initiative, the UK invited other European countries including Belgium, Italy, Germany and the Netherlands to participate in this project (Sheehan, 2007). Preliminary work on this project began in 1962 and by 1964, ELDO formally came into existence (Sheehan, 2007). Another strategic aim of this invitation was an attempt to get closer to the leading continental states that were Member States of the European Economic Community (Lundestad, 2010).

In turn, the leading European countries were also interested in participating in this initiative for their own specific reasons. Germany was trying to re-enter the European community and re-establish connections with its neighbours that were eliminated by the war (Sheehan, 2007). For France, this project brought the greater technological autonomy that President Charles de Gaulle was striving to gain at the time. After the arms race between the USSR and the USA had started, de Gaulle decided that France should maintain its reputation by undertaking an ambitious space project. Moreover, the President tried to weaken European dependence on NATO by developing French nuclear facilities. De Gaulle undoubtedly wanted access to US and UK nuclear and space technologies. He welcomed the UK's "turn to Europe". Nevertheless, he vetoed the UK's attempt to join the EEC in 1963 explaining that this would exacerbate Europe's dependence on the Atlantic alliance (Al-Ekabi, 2015).



Prime Minister Harold McMillan expressed his desire for the UK to cooperate with Western Europe and to enter the three European Communities perhaps as a means of achieving the country's goals through new means (Baker and Seawright, 1998). In his 1961 Parliamentary speech, he said that joining Europe was a duty and in the interests of the UK to aid Europe in their fight for freedom (HC Deb, 2<sup>nd</sup> August 1961, Hansard, 645, col 1480-1606). He did however remind the House that the EEC was an economic community and not a defence partnership Young (2000) and Bell (1995) opined that this desire was connected to Britain's declining world power status and McMillan's awareness that leading European states were gaining power. Deighton (2006), among others, claimed the opposite. She asserted that 'the adverse effects of British post-war arrogance were now all too apparent' (2006, p41) and that the country's priorities had not much altered after the war. Pagedas (2000) also noted that McMillan was trying to 'have his cake and eat it'- to gain EEC membership but also maintain close Anglo-American ties. Despite the controversy between these two standpoints, they are both justified by empirical evidence. When negotiations began for the UK's entry into the EEC, Britain had started to participate in European common affairs actively. The heightened success of the EEC as well as the strained relationship between the UK and the US after the Suez Crisis in 1956 drew Britain to reapply to the EEC under Prime Minister Harold Wilson (Furby, 2010). Nevertheless, Krige and Russo (2000) opined that this increased activity was only an excuse to join the European Communities.

The UK had of course been a founding member of the European ESRO and ELDO organisations involved in the setup of the Blue Streak missile launcher. Both initiatives were beneficial for the US which strived to stimulate European collaboration and to avert unilateral dissemination (Millard, 2018). Tom Paine, NASA Administrator said,

'his rather paternalistic goal in Europe' was "to stimulate Europeans to rethink their present limited space objectives" and "to help them avoid wasting resources on obsolescent developments [such as their own launch vehicle]." (Logsdon, 2015, p110).

Upon his return to Washington following a European tour in 1969, Frank Borman, Richard Nixon's advisor, then reported that "space technology in Europe lags behind

American achievement by a considerable amount” and suggested that the United States,

“immediately request an international agency to select a certain number of qualified scientists from different nations of the earth to join our program to participate as scientists/astronauts in future Earth-orbital space stations.” (Logsdon, p10: 2015).

The foundation of these organisations has become one of the first steps towards European space industry institutionalisation. Thus, it can also be deemed as a starting point for increasing returns.

ELDO was a contentious issue between England and France in the debates on European political direction in the realm of space. Early French efforts to develop missiles and launchers were important for the later creation of a technological base, which, with German expertise in propulsion systems, aided the remarkable success of the future Ariane launchers (Dupas et al. 2001). This foundation is one in which other European states have added their valued contributions (Dupas et al. 2001). While France and Germany strived to gain greater autonomy for Europe and wanted only European countries to work within the space initiative, the UK in contrast desired to gain maximum possible benefit from the existing technology and reinforce its relationships within the North Atlantic Alliance, the US and its European allies in particular (Harvey, 2003). The UK supposed that replication of the US technology would be wasteful (Massey, 1986) and that it would be more feasible to purchase existing NASA’s satellite launchers rather than design solely European ones (Krige and Russo, 2000).

In the mid-1960s, the UK had the choice to buy a comparatively cheap American military satellite<sup>5</sup> but chose instead to invest heavily in the development of their native satellite. Doing so created new jobs and promised a greater degree of independence in space capabilities from the US (Bowen, 2020). This choice initiated the EU-UK prioritised partnership with increasing returns later in the form of

---

<sup>5</sup> Harold Wilson’s government chose the British-made Skynet military communication satellite, instead of GCHQ’s (Government Communications Headquarters) preferred option of an American model. From: Aldrich, R.J., 2012. GCHQ: The Uncensored Story of Britain’s Most Secret Intelligence Agency Response.

participation in large-scale projects such as Galileo and Copernicus. However, the option of choosing either Europe or the US as a key partner in space affairs were mutually exclusive. This choice implied that interactions with the US and NATO were no longer as important for the UK anymore (Bowen, 2020).

As mentioned previously, lack of financial resources and budgetary constraints were a major concern for the UK. Its subsequent turn towards collaboration with Europe was summarised by a British minister who suggested that having an independent European launcher was economically wasteful since launchers are the most unprofitable element of space technology. Whereas satellites, which are comparatively less expensive, bring commercial advantages<sup>6</sup> (Hoerber, 2016). In 1966 at the ELDO Conference, after declaring their intention to expand the initial programme at the request of France, the UK insisted on a decline in its financial contribution and threatened to withdraw from the project if this was not allowed. The UK's contribution did decrease from 38% to 27% but the contributions of France and Germany increased to 25% and 27%, respectively (Harvey, 2003).

An important final determinant of the UK's withdrawal from the ELDO project had occurred when de Gaulle rejected the second British application for EEC membership in 1967 for similar reasons to 1963. The UK's government reacted to this dismissal by starting to oppose French policy in several key areas, including space (Sheehan, 2007). This was another critical juncture that significantly influenced the complicated relationship between continental Europe and the UK. As a result, Britain stood in opposition to France and Germany on many issues in the space industry. For example, when France insisted on shifting ESRO priorities from scientific to commercial satellites, the UK threatened to abandon the European space effort. The argument was mainly about individual state financial contributions. In the same way, Germany agreed with these propositions by France (McDougall, 1985). It also

---

<sup>6</sup> These advantages may include: the use of sensor networks, supporting offshore exploration, improved broadband connectivity for global transportation networks and telecommunications coverage in remote locations. <https://blog.bosch-si.com/internetofthings/10-benefits-satellite-communications-brings-to-the-iot/>

appears to be a point where increasing negative returns for their common European future started.

After its withdrawal from major European space projects in the 1980s, the UK became a second-tier player. There are signs that Britain revised its attitude to space programs and space defence by offering a more open position to Europe. Since 1987, the UK declared that it invested in space as a tool and generally not as an ultimate goal or for factors of prestige (Hicks, 2009). In a House of Commons debate on the 4<sup>th</sup> of November 1987, MP John Butcher declared;

“I am sorry to say that over the last 12 months the ESA proposals have become even more expensive as it has recast the cost estimates of its ambitious schemes,” (HC Deb 4<sup>th</sup> November 1987, 121, col. 1039).

The subsequent withdrawal by the UK from various high-profile ESA programmes was a landmark decision. Hicks (2009) argues that this moment was pivotal and UK space policy hardly changed from 1987. This approach to space projects has been integrated into organisational structures by ensuring that financing for space projects is conducted alongside the financing of other non-space projects to attain the same goals (Hicks, 2009). This attitude to space policy has been declared in the “UK Civil Space Strategy: 2008-2012 and beyond” (BNSC, 2008).

Since their failed project of an independent British missile and rocket capability, the UK has preferred to conduct space activities in collaboration with its allies namely, ESA, the EU, the US and private companies. Doing so has seemingly all but eliminated the UK’s independent space capabilities. However, the British government still acknowledges the need for autonomy in space affairs and the need to develop its space programme in the 21<sup>st</sup> century as highlighted in their more recent policies (Paikowsky, 2017). Nevertheless, Bowen (2018) argues that space policy is still lacking in British strategy albeit essential to critical infrastructure and military capacity.

The UK’s National Security Strategy 2008 and 2009 (NSS, 2008; 2009) appears to have ignored space defence issues. It contained common formulations about a ‘complex and dangerous world’ with numerous threats and potencies but without specifying

the country's strategic aims and whether it had the resources to attain them (Porter, 2010).

Brealey et al. (2013) summarised the proceedings of the Space Security Seminar at the London Institute of Space Policy and Law in 2012. They highlighted the long-term rewards of developing space technologies as outlined by Martin Johnson, the Deputy Head for Space Policy at the Ministry of Defence. Mostly focusing on the UK context, Johnson considered it in the light of international space affairs. He also claimed that two sets of questions in formulating their common space policy then arose. The first set of questions is: *who is the policy for? Who will implement it and will it will be implemented at the country or industry level?* The second set of questions is: *What does space security imply? Does it include space objects whose security needs to be ensured or is the capacity to do so on Earth instead?* According to Johnson, it would be more practical to address the difficulties of ensuring space security of all participants of space programmes which is especially relevant for resources owned by several different actors.

A fully-fledged National Space Security Policy was first issued in 2014 then superseded by the National Space Policy in 2015 (Quintana, 2017). Distinct from the strategies published in 2008 and 2009 is that by 2015 it contained a space security and reaction plan in the event of a total failure or a complete denial of space services.

The 2017 UK Air and Space Power Doctrine (UK Government, 2017) considered space power as one of the pillars of British military strength. ADD MORE FROM IT HERE? The Doctrine specifically formulates four key dimensions for ensuring state security. These include (i) situational awareness in space, (ii) control over space that comprise both protective and offensive activities to provide freedom of operations in space, (iii) maintenance of space operations, and (iv) maintenance of space services that includes ensuring launching activities and the protection of space assets.

The Defence Sector Modernisation Programme (UK Government, 2018) deems space as a military area alongside air, cyberspace, land and sea. It further admits that space may be a field of war. The UK Ministry of Defence also announced the

forthcoming issuance of the Defence Space Strategy (DDS) in 2018 (RUSI, 2019). Although it has still not been published, the government's focus is clear, that space is a new domain of opportunities and threats. The DDS is expected to declare the following three strategic goals regarding space: (i) the enhancement of sustainability efficiency of operations in space, (ii) the attribution of space to the sphere of military interests and (iii) the corresponding support of the government's efforts in this domain (Polkowska, 2020).

As for relationships with international allies, despite developing its independent space programme and space security strategies, the UK maintains connections with both Europe and the US. In 2020, the UK and the US signed a technology safeguards agreement to more easily allow US firms to bring rocket hardware to the UK. This represented a significant lessening of space-related equipment movement restrictions and allows US companies to now launch from UK spaceports (Foreign, Commonwealth and Development Office, 2020). In 2019, the UK also increased its contribution to ESA<sup>7</sup> in an effort to strengthen its authority in the Agency and to influence ESA strategy development in a manner similar to other leading European space nations such as Germany or France.

## **4.2. EU Space Policy**

### **4.2.1. Europe's first commitments to space cooperation**

As previously mentioned, the increasing interest in space by Western Europe occurred against a backdrop of rivalry between the US and the USSR. European countries did not have such sizeable space budgets as these two mega powers and were unable to compete on similar economies of scale. France and the UK were the most technologically advanced and active states within post-war Europe. No wonder that then that they laid the foundation for the future of the European space industry (Reillon, 2017).

---

<sup>7</sup> The UK joined all ESA member states in supporting a 10% rise to its space science contributions. Department for Business, Energy & Industrial Strategy, UK Space Agency, and The Rt Hon Andrea Leadsom MP (2019).

Western Europe's relationship with outer space in the late 1950s and early 1960s often centred around the pursuit of intra-European peace, the embracing of technology to promote economic development and power, East-West confrontations and its pressures to exploit technology for military use in response to the Soviet threat (Sheehan, 2021). It was in this environment that NATO and the WEU sought to promote European space cooperation for entirely 'peaceful' purposes. (Sheehan, 2021).

As shown in the previous section, there had been two opposing viewpoints on the perspectives of the space industry development between the UK and Europe. President de Gaulle had insisted on the necessity to rely on Europe's facilities but the UK had been more inclined to continue its partnership with the US at that earlier stage (Hoerber, 2016). So the choice of Europe forging its own path was one of the most critical junctures in the entire history of its space policy. The main consequence of this choice was the reinforcement of its autonomy. Europe had locked itself into the framework of continental cooperation and with it came a refusal to partner closely with outside actors. This choice did not stop all contact, as international cooperation at the supranational level between the leading European powers has become the main trajectory of their development. This did, however, allow smaller European countries deprived of their own space programmes to participate<sup>8</sup> in common European projects for the benefit of all EU member states. From that point, Europe, by and large, could only rely on itself in the development of the space industry.

ESRO became the first European intergovernmental organisation in the space domain in 1964. Its founding principles stipulated in Article II that its purpose was 'to provide for, and to promote, collaboration among European states, exclusively for peaceful purposes.' (Geppert et al. 2021, p107). Previous attempts by European countries to coordinate efforts in creating a space project in the previous decade had failed. The Blue Streak project had been too costly for Britain to bear alone so the financial burden was shared by its members to transform the initially British

---

<sup>8</sup> ESA membership has allowed smaller Countries such as the Netherlands, Switzerland and Sweden to access space programs, to develop advanced technologies and support commercial growth of their firms in key industries (Petroni et al. 2018).

project into a European one. Its six members, Belgium, France, Germany, Italy and The Netherlands had established the European Launcher Development Organisation (ELDO) in 1962. However, the limited commitment levels of some participants and the poor performance of the three-stage rocket Europa contributed to the programme's collapse in 1973 (Hoerber, 2016). As soon as 1965, France had expressed serious doubts about its initial programme. They believed that it would not be powerful enough to launch satellites into geostationary orbit. One year later, Britain criticised the technological use and economic viability of the initial programme. By 1968, ELDO rockets were indeed failing one after another. The UK quickly retreated from the programme and froze its budget contributions. At its ultimate collapse, it had cost \$700 million and had not launched even one satellite successfully into orbit (De Maria and Krige, 1992).

Nevertheless, this marked the beginnings of European space industry institutionalisation. The UK's efforts to create an independent space project had not been institutionalised. "The rules of the game" had not been prescribed for the British and potential outcomes had not been forecast due to the lack of regulatory framework in the space domain. Meanwhile, the establishment of ESRO and ELDO in Europe implied that the involved nations had to negotiate the regulations and boundaries of their participation, and in so doing they constructed a tangible regulatory framework.

Although European engineers independently created all the elements of communications satellites, none of the participating states had the technology to deliver the equipment into space. *Symphonie* satellites designed at French and German facilities required US or Soviet launchers to carry out the installation (Wang, 2009). In the terminology of HI, this was a reactive consequence of the chosen autonomy path (Rixen and Viola, 2016). However, given the European move towards autonomy initiated by de Gaulle, this consequence was especially challenging. After the Europa project failed, two important events took place at the European Space Conference 1972-1973 the presentation of the new Ariane satellite launcher and the decision the merging of ELDO and ESRO to form the European Space Agency (ESA) in 1975 (Zabusky, 1995).



At that initial stage, space cooperation centred around relationships between governments with each still protecting their national interests. Member states were concerned about sovereignty so declared commitments in these intergovernmental projects were unreliable. The desire to undertake cooperative space programmes was an expression of antagonism towards the US. This desire to cooperate in Europe threatened to break the transatlantic monopoly on advanced missile technology and was deliberately designed, at least by France, to ensure European space autonomy (Krige and Russo, 2000). Nevertheless, protracted agreement processes by states determined to protect their national interests had until then damaged prospects of an entirely supranational European space policy, Nonetheless, only four states agreed to participate in the Programme at first, the others found no industrial benefit in it (ESA/PB-ARIANE(79)30, 29 August 1979 and ESA/C(79)119, 4 October 1979 (ESA 636) in Hoerber, 2016).

#### 4.2.2. The European shift into space

This subsection reflects on the later progress of European space industry industrialisation to show how space policy has become a priority for the European defence agenda. The author considers the implications of the EU institutions sharing this regulatory field with ESA and how the scope of regulation has changed from a purely civil and commercial function to now include the military aspects of space defence.

The EU began its space activities in the 1970s when the first resolution on cooperative participation in the space domain was issued by the European Parliament. The main resolution message mirrored the French viewpoint at the time that supranational efforts were needed by European countries to satisfy their needs and avoid dependence on external actors (EP, 1979). The major initial assets of their new space resolution were the European Communities Joint Research Centre (JCR) whose primary focus was nuclear energy but also space to a lesser extent, and the establishment of the ESA supranational framework (Sigalas, 2016). Of note was the fact that no military aspects of space exploration were not at all mentioned in this first resolution.

ESA had become the leading European actor in space affairs by the 1980s. In 1981, a new resolution by the European Parliament was released that called on the Commission to examine the feasibility of building a European space shuttle that would ensure autonomous access to space (EP, 1981). In 1985, it issued a resolution calling for the long-term development of the European Space Program (ESA Council, 1985). Increased interest in space by the EU came when the Single European Act (SEA, 1987) was ratified, providing the Union with the legal credentials to conduct research. The EU Parliament published a new resolution that same year which stressed that the Commission should take a more active role<sup>9</sup> in determining long-term policies on space exploration and applications (EP, 1987).

The Commission's first steps in this direction were then made the following year when its Vice-President Karl-Heinz Narjes held negotiations with the largest aerospace entities (Jones 2002). It also published a strategic report in which the Community was condemned as inactive and insufficiently organised to adequately promote space technology (CEC, 1988). The strategy had proposed to extend space potential to allow other policy areas to extract benefits. But it also conceded that Europe still lacked a consistent and holistic strategy that would fully capture the technological, commercial, social or defence dimensions of the space domain (Suzuki, 2003).

In 1991, a new EP resolution invoked the Commission to adopt a European Space Programme in the interests of the entire European community. The Commission intensified its participation in the space sector by creating an expert panel to explore possible space policy actions (EP, 1991). The panel listed security as a dimension of space policy, emphasising the situation would not be fully representative without it. They also noted possibilities to promote a European space defence system in the Western European Union (WEU). This would mean lower dependence on US facilities and even the elaboration of an autonomous navigation system. This was, in fact, a presage of the Galileo project (CEC, 1991).

---

<sup>9</sup> French President François Mitterrand, in particular, feared that Europe's fragmented approach to aerospace R&D would be quickly exposed by US President Reagan's Strategic Defence Initiative (SDI) and by the aerospace ambitions of Japan. See Jones (2002).

In 1996, the Commission finally identified space defence aspects as a priority and as increasingly significant within military affairs (CEC, 1996). The Commission noted that military considerations had first promoted the same space technologies which were later employed by civilians. However, a reversed trend was gaining strength whereby civilian space technologies were subsequently utilised by military forces. With the continued militarisation of space, EU policymakers stopped opposing plans to link civilian assets with defence elements (Johnson-Freese, 2007). The development of an autonomous satellite navigation system, therefore, became an EU priority as it sought closer relations with ESA and the space agencies of individual European countries (CEC, 1996). ESA meanwhile has continued to develop launching capabilities through the Ariane project, with Ariane 6 being the latest modification developed last year (Parsonson, 2020).

#### **4.2.3. The Galileo and Copernicus Projects**

##### **EGNOS/Galileo**

An independent satellite navigation system was pursued mostly for reasons of autonomy. Sigalas (2017) claimed that a space-related weakness uncovered during the Kosovo conflicts was a critical juncture for European space industry development. The US Department of Defence had halted the service of the Global Positioning System (GPS) during the Kosovo operations in 1999. The disruption caused air traffic issues for European airlines above the Adriatic (Feyerer, 2015) and understandably dissuaded Europe from overly relying on the Global Positioning System (GPS) for aerial safety.

The main problem was that the US administration had used ‘Selected Availability’ for their GPS system, which offered enhanced signal quality for military operations at the expense of less precise civilian data (Suzuki, 2003). European services had in effect been using a navigation system completely managed by a foreign owner and suffered from this lack of control as a result. Although the US and the EU maintained peaceful relations and most EU countries were part of NATO; the Commission wanted to guarantee conditions that would stop civilian services from being undermined arbitrarily in this way (Suzuki, 2003). The episode served as one more reason to favour the development of an autonomous satellite navigation system.

Debates on the necessity of an autonomous navigation system had been ongoing since 1994. The European Council, the Commission and ESA had so far negotiated a two-stage process (EC, 1994). The EU was due to construct a network of satellites to improve upon GPS signal strength for Europe and then later proceed to develop completely independent capabilities (EC, 1994). This then involved the construction of the European Geostationary Navigation Overlay System (EGNOS) which later became the foundation for the Galileo programme (Reillon, 2017). Galileo can be explained by a twofold logic then. Namely, the desire to end dependence on US-controlled GPS and to more greatly benefit from broader commercial applications of satellite navigation (Suzuki, 2003). According to a PricewaterhouseCoopers report, the largest and most sustainable benefits from Galileo have been in aviation services and maritime navigation (PWC, 2001).

Its development nevertheless caused considerable conflict both within and outside the EU. Since the UK and the Netherlands opposed an entirely public fund for the programme, the Commission had to resort to a public-private partnership (PPP) mechanism aimed at transferring a portion of project costs to private investors and the industry sector (Beclard, 2013). The long-term nature of the project and the relative impossibility to calculate its exact costs and benefits made business outcomes of the programme unclear and difficult to forecast. The PPP then completely collapsed in 2007 when the Court of Auditors revealed signs of inappropriate leadership by the Commission in managing the project (CoA, 2009). Multiple liability issues were also found along the supply chain which contributed to its failure (Sitruk and Plattard, 2017).

The US had also expressed concerns about its construction. US Defence Secretary Paul Wolfowitz believed that Galileo might interfere with NATO's military equipment and some envisaged that Galileo could even become a potential threat to US national security (Suzuki, 2003). The EU and the US finally agreed in 2004 that GPS and Galileo would have complete mutual compatibility (Beclard, 2013). Since the collapse of the PPP, Galileo has been funded solely through the EU budget. The European GNSS Agency (GSA) was delegated to govern the programme and track its performance so the EC bears full responsibility for the programme on behalf of the EU.

## GMES/Copernicus

Copernicus is another major joint space programme between the EU and ESA. It comprises a set of facilities that work to ensure comprehensive monitoring of the Earth's surface<sup>10</sup>. Launched by the Council and the Parliament in 2010, the programme was initially called Global Monitoring of Environment and Security (GMES) but renamed Copernicus in 2014. The system is “Europe’s eyes on Earth” (EEA, 2021) as it gathers both publicly available and confidential data on security and defence activities. Besides collecting and rendering data for commercial and scientific purposes, the programme has a substantial ‘Security Service’ component. The latter concentrates on three domains namely, Border monitoring, Maritime monitoring, and Support to EU External Actions (SEA) working in conjunction with other EU security agencies (Copernicus, 2021). Copernicus provides data to the European External Action Service (EEAS), via the European Union Satellite Centre (SatCen) that is utilised to further enhance European territorial awareness where the EU conducts military operations (Copernicus, 2017).

## Institutional aspects of European space management

Because of these joint programmes, it is necessary to analyse the distinguishable functions of the ESA and the EU organisations concerning the ESP. Institutional settings are important for determining the roles played by either party and the potential effects on their space programmes. European space governance systems have multi-faceted and interconnected layers of authorities that make final decision making a complex and slow process (Mazurelle, et al. 2009). These systems combine rules and norms originating in a variety of global, intergovernmental and national legal frameworks which ultimately determine European space policy and its actions within particular space programmes (Mazurelle et al., 2009). Even though ESA has been the main supranational body in space governance so far, the EU as an institution has become more active in space security policies that were previously governed by ESA alone. Both organisations are therefore keen to influence the

---

<sup>10</sup> Copernicus also collects and analyses data related to atmosphere, climate change, as well as security and emergency services from satellites; ground, air and sea-based measurement systems. See: EC (2021) ECMWF Copernicus services - General Q&As.

definition of space policy and to determine how the funding will be spent (Schout et al., 2019).

The multi-governed ESP as a result is sometimes inconsistent and incongruent in its objectives, purposes and financial capabilities (Kilmborg-Witjes, 2021). The Commission established that the ESA principle of *juste retour*- where EU financing from particular nations is only used by research teams from those same countries- cannot be fairly employed in space projects with direct EU involvement since that contradicts EU fair competition principles prescribed in their treaties (Hobe et al., 2006). This contradiction in industrial policy outlines its erratic regulations that hardly correspond with one another. Member countries including France, Germany, Italy and more recently the UK, hold much larger influence over ESA as they now have their own national space agencies, autonomous space projects and capabilities in the aerospace industry. To support fair competition, the Commission acts against industrial superpowers that strive to monopolise entire sectors, as is the case here. They pay more towards the ESA budget and, as a result, have contracts of larger scope for their aerospace facilities in line with the principle of *juste retour*.

Differing financial principles and approaches are not the only hindrances to productive interactions here. The two institutions also have distinct roots and separate organisational structures and members. Whereas the EU currently consists of 27 member states (UK Government, 2021), ESA comprises 22 countries, including the UK, as a non-EU member. Norway and Switzerland are in the same position, as ESA members but not part of the EU (ESA, 2021). In addition, Canada cooperates with the ESA on special terms, which allows the country to be present at the Council's meetings and to take part in ESA's space programmes.

ESA and the EU were first ratified by the 2004 Framework Agreement which is automatically extended every four years. ESA concentrates on the technical issues of space programmes and research and development matters in its terrestrial facilities, whereas the EU provides regulatory supervision of the industry on behalf of its European citizens. The governance of in-orbit activities is co-financed by both parties. The Commission has devolved programme management to the European GNSS Agency (GSA) that utilises ESA's physical infrastructure (ESA, n.d.).

The differing legal frameworks of the two organisations also obstruct their unified success. EU Treaties tend to have a quasi-constitutional form whereas ESA is based on a collaborative agreement between its member states who contribute proportionally according to their gross national product (Mazurelle et al., 2009). This means that ESA agreements give all their members states nearly complete control over their own funds. Only 20% of ESA financing is directed to obligatory programmes, and the remaining 80% to arbitrary programmes such as satellite communications and Earth monitoring (ESA, n.d.). It is the ‘optional’ programmes in which ESA member states can choose to participate that distinguish ESA flexibility from the EU’s comparative nature of bureaucratisation (Reillon, 2017).

#### 4.3. Summary

To sum up, three periods in UK space policy development can be currently identified. Many more periods and subperiods could be analysed in detail and this may be a subject for future research. The first period is characterised by the UK’s domination in the emerging European space industry when Britain was undertaking its largest and most ambitious projects. This ended with the failure of the Blue Streak initiative which appeared unfeasible and too costly to be borne by a single country.

The second era is the UK’s closer partnership with the EU. This is the period of emerging institutionalisation of the European space industry and the elaboration of its initial space policy. For the UK, this period is connected with the loss of its dominant role in European space affairs and its consequent gradual estrangement in the space sector from leading European countries such as France and Germany. From a long-term perspective, British plans to flourish in Europe did not transpire as desired because the UK had decided to systematically retract its participation in European large-scale space programmes. For the EU however, this was a period of increasing self-awareness and grounding in its identity. During this time, space industry development was more enthusiastically deliberated upon by its European leaders. The dependence on US satellite launching facilities still did not allow the EU to operate with complete autonomy, however.

For the UK, the third period is connected with ultimate and almost total ring-fencing from EU space programmes and the formulation of its independent space policy.

Brexit also has contributed to this process. As for the EU, this period started with the Kosovo accident that led to the final decision to build an autonomous satellite navigation system to maintain the security of the civil commercial services connected with its space capabilities. As shown, this period was also characterised by the complex interaction of ESA and the EU space institutions.



## **5. Discussion**

This chapter considers the key results of the analysis and compares them to the reviewed literature. This chapter shall first discuss the appropriateness of the various proposed theoretical approaches. The empirical findings shall then be discussed from the perspective of historical institutionalism. In particular, the HI concepts applicable to the development of the EU and UK space industry and its space defence policies are discussed. Although the space policy paths of the EU and the UK have been tightly intertwined since the emergence of the European space industry, it is feasible to discuss them separately to show their differences.

### **5.1. Discussion of the Theoretical Framework**

It is necessary to first discuss the appropriateness of HI as a theoretical framework for the analysis or whether other reviewed theories could better explain the development of the UK and EU space policies. Chapter 4 showed that the choice of HI was fitting and that neither of the other two related theories would explain the processes more efficiently. This conclusion can be made by following the main principles of these theories which shall now be examined in depth.

The analysis showed that the development process of EU and UK space policies had been ongoing since the 1960s. Moreover, this process has not been linear as both regular and accidental events affected their nature. The points of time when accidental events occurred are discussed below. Overall, however, the processes of their space policy development have been relatively consistent and can be explained by previous events and aspirations of the involved parties. The so-called *paths of processes* can be easily traced which is in line with HI and is also discussed below. Employing HI in this study aided the explanation of causal relationships between events and also their consequences to more fully represent the developmental process of their space defence policies over time (Pierson, 1998). In particular, HI helps to indicate the stages of space defence policy institutionalisation, that is, the formulation of the “*rules of the game*” common to all the involved actors and stages of this process. Specific to the European space industry development is the complexity of relationships between countries and supranational organisations such

as ESA and the EC. Therefore, institutionalisation in the form of determining formal rules, norms and regulations has been necessary for further development.

As for the other two theories, the RCT would be less appropriate because it only makes “snapshots” of equilibria for different combinations of actors, it is unable to reflect the development of the process over time. This might make it useful for the analysis but only as an auxiliary rather than the main analytical framework of the study. In any case, most RCT models stipulate that no actors are willing to make a move unless other actors do. This is not the case for the space defence industry as several parties including the EU, the UK, ESA and the US are constantly making adapting their policies without considering the actions of other actors in the field. Equilibria of this type would be difficult to describe (Schofield, 1978). Besides, the RCT predicts that in many instances, actors would determine the most effective way of acting and strategically align to that pattern (Osborne, 2004). As the history of UK and EU space security policies show, the main actors have applied different strategies in pursuit of their own goals so that no convergence in their actions can be observed.

As for SI, it would be less appropriate than HI as it considers institutions in a broader sense rather than only determining their formalised rules (Kostova et al., 2008). Moreover, SI is more focused on exploring the consistency and continuity of historical processes over time and pays less attention to the tipping points, or critical junctures that may change the nature of the process significantly. It is useful to consider the political, economic and technological contexts that contributed to the development of these agencies and organisations. SI would be useful to explore the role of actors such as space agencies of certain countries, international agencies and supranational organisations, therefore. But Jepperson (2002) fairly noted, these organisations cannot be considered as part of general society, as there are particular conditions within the space sphere.

Nevertheless, it is also necessary to underline significant drawbacks of HI that affected the quality of the study’s analysis. HI attempts to explain the development of processes over time by accounting for anticipated outcomes and the role of random events that may influence decision making. As such, it is useful for tracing how and why institutions emerged and what were the possible alternative scenarios.

However, HI is understandably focused on the past, so it is feasible to utilise it for explaining what has already happened and how it occurred. HI pays significant attention to critical junctures, increasing returns and undesired outcomes to broaden understanding of past circumstances and the consequences of prior events. But for predicting and analysing possible future scenarios, it is undeniably of lower utility. HI is unable to fully assess the significance of current incomplete processes, unlike RCT that estimates current equilibria to predict the most probable future scenarios. The limitations of HI when applied to European and UK space security policies are discussed below.

## **5.2. Discussion of Empirical and Conceptual Findings**

The benchmark paper for a discussion of the results attained in this study is from Sigalas (2017) who explored the history of the European space policy in light of HI. The first distinction of the present study from that paper is that the author explored the EU and UK space policies separately whereas Sigalas (2017) did not. The main reason for separating the policies is that these two actors have followed distinct paths which have intersected and overlapped at times, even though their interests were often opposing. Therefore, it looked feasible to separate these policies and consider the periods of interest overlap from both UK and EU viewpoints.

Sigalas (2017) discusses four concepts of HI, namely supranational autonomy, non-linear development, critical junctures and unintended consequences, the latter three being unique attributes of the theory. Sigalas also indicated the path of European autonomy in space research starting with European involvement following initial failures with the British Blue Streak project to the creation of the EU autonomous satellite systems such as Galileo and Copernicus. The capacity of the aerospace industry of any single European country was also shown to be insufficient due to capital intensity and the large funding requirements to run a fully-fledged space programme. This is another example of how historical decisions determine the path of development, namely here towards more integration as such large space projects could not be handled by any single country.

Therefore, a collaboration between European nations was required to launch a project of such scope. Thus, to some extent, a paradoxical situation emerged as the

European space policy was affected by two supranational institutions. Initial agreements in the space industry had evolved into ESA as the sector's technical and industrial framework and the EU as the supranational governing body with powers extending into the space industry. But Sigalas instead noticed the tendency towards gradual ESA absorption into EU structures although he argued that their full fusion is not imminent.

### **Non-Linear Development**

Another notion offered by Sigalas (2017) was about the unpredictable nature of European space policy development. The present study confirmed these conclusions. As previously mentioned, in his study Sigalas did not elucidate on the role of the UK in this process. In this study, it was found that the UK had suffered less damage in World War Two and so had the impetus to become the dominating space power on the continent. However, its financial and technical shortcomings meant that this ambition could not be realised. Partly because of the UK's role in the origins of ESA, it became a key part of its supranational autonomous European projects such as Galileo. However, political contradictions with European allies persuaded the UK to withdraw from EU space projects and focus on the development of its space policy. With regards to HI, these factors emphasise the role of change and dynamics in the development of institutions and their consequent effects on the space policy.

### **Critical Junctures**

Sigalas (2017) insists that the development of the European space policy was neither linear and fully predictable nor was it accidental. He states that it was instead a combination of deterministic efforts with programmable results affected by random, unanticipated events that had accidental outcomes. This is fully in line with the HI concepts. However, even though there were several critical junctures in its formation, Sigalas highlights only the Kosovo accident which resulted in GPS disruption to civilian services.

This study's analysis found more notable junctures than the Sigalas study. Churchill's provocative speech in 1946 did not affect the space industry directly but it predestined the British shift from its space partnerships with the United States and Australia to its stronger alliances with European powers in the sector and its

subsequent voluntary withdrawal from further EU collaboration in favour attempting to implement its autonomous space policy. Partnership with other space exploration participants was a reactive consequence of the readiness to collaborate with partners declared by Churchill but also a consequence of financial constraints permanently faced by Britain. The recent Brexit process has exacerbated this isolation and made further partnerships with the EU more problematic.

Another critical juncture with implications for UK space policy was the French reluctance under de Gaulle to involve the UK in the EEC, culminating in two successive French vetoes of the UK's application to the community. While the UK was keen to cooperate with all possible allies including the US, the French strived to gain full autonomy for Europe including in political, economic and technological affairs. After this double refusal from the French, the UK started to oppose French-generated initiatives and ultimately became their direct opponent. Once again, this was not purely a matter of space defence policy but a much broader political controversy. Nevertheless, it affected the divergence of the British space security policy development course from the European one.

Another critical juncture was the failure of the Galileo private-public partnership set up by the Commission and intended to ensure budgetary independence away from outside parties. Although Sigalas (2017) mentions this juncture briefly, he did not analyse it from an HI perspective. We argue that this was another point at which the development of the European space policy could have changed course. If the PPP had thrived, the Commission would have likely maintained its management over the Galileo programme. However, since it had failed, following signs of inappropriate leadership by the Commission, project funding was imposed on the EU budget instead.

The author contends that the Brexit vote and the implementation of the UK's decision to withdraw from the EU was another juncture point, although the full outcomes of these changes remain uncertain for now. The UK remains a valid member of ESA since ESA is not a purely EU organisation. The UK has withdrawn from certain EU projects such as Galileo while there still is a principal agreement that the UK will remain a third-party member in the Copernicus project (Rough et al., 2021). Potentially, given the increasing estrangement of the UK from EU affairs, this may

lead to a further conflict of interests between the EU and UK space defence policies in the future. It can be speculated that the UK will either seek new partners or focus on the national space policy in future.

### **Unintended Consequences**

Sigalas (2017) emphasises the complexity of policymaking in the EU. Decisions taken by authorities in supranational institutions such as the EC and national governments may contradict each other or meet resistance by dissenters due to this multi-layered approach. Conflict may be caused by divergent interests, information asymmetry between governments and international organisations, limited time for decision making or the influence of random events that may not directly affect the decision-making sphere but still influence the actors' attitudes and understanding. As a result, actors do not always clearly predict the consequences of their decisions (Morisse-Schilbach, 2006). Sigalas (2017) notes that all these factors may push governments to make decisions that they perhaps would not normally have made without additional distractions. Such supranational governance nevertheless may increase the autonomy of supranational organisations, enhance EU competencies and ultimately lead to the elaboration of new policies. For Sigalas, (2017) although clearly designed regulations can have predictable consequences, some decisions can be driven by random events. As a result, policies are vulnerable to this interplay between path dependence factors and such random accidents.

Unintended consequences often accompany critical junctures because undesired accidents may well evoke similarly undesired consequences. The analysis in this study confirms these conclusions. De Gaulle's behaviour towards the UK had long-lasting consequences in the form of the UK's swift opposition to French initiatives including its proposed elaboration of a European space defence policy. It is unlikely that such consequences were expected or desired but his government's actions were likely to have been a strong factor in the outcome. De Gaulle's refusal has had increasingly negative returns since its consequences have been deemed much more significant since the initial event. Sigalas (2017) does not use the HI concept of increasing returns in his study and it would be useful for explaining how seemingly insignificant events led to significant policy decisions over time.

## The Militarisation of Space Policy

Sigalas (2017) ignores the gradual militarisation of space policy in the EU and the gradual splicing of military and civil aspects of its space policy. Our analysis instead showed that the space industry did in fact have military origins. We found that the UK was the first European nation, notwithstanding fascist Germany, to have planned the building of a ballistic missile system in post-war Europe. But after the failure of the Blue Streak and Europa projects, European space-related activities temporarily diminished. This shows the implications of past attempts for the present state and direction of the space programme.

The paradox is that while Europe was striving to become autonomous and rid itself of US influence in its space affairs, they were still depending on the US and the Soviet Union to supply them with the necessary satellite launchers to complete their space projects because Europe did not have its own (Al-Ekabi, 2015).

After the Kosovo accident during the Balkan Wars, the leaders of the European space programme decided that the development of a long-desired European navigation system was inevitable if Europe wanted to conduct an independent space policy and not depend on the US. This is another example of a critical juncture that has determined the shift in space policy of the EU.

Most authors including Adam (2015) and Reillon (2017) note the entirely civilian nature of the European Geostationary Navigation Overlay System (EGNOS) which was later known as the Galileo programme (Reillon, 2017). Its greatest benefits are now in aviation and maritime affairs (PWC, 2001). However, our analysis shows that according to the latest shift towards a combination of civil and military trends in space policy, aerospace facilities are now considered in light of their military applications as well. From the viewpoint of HI, this shows a gradual development from the civil space into a combination of civil and military space.

It is worth agreeing with Klimburg-Witjes (2021) that boundaries between the military and the civil vanish in space policy especially in terms of its defence considerations. ESA's origins were the research organisations ELDO and ESRO, yet ESA became the main actor in the European space industry and determined its space policy in partnership with the EU, its focus was shifted towards civil applications of

space infrastructure. However, times have changed and the EU has increasingly turned its attention to the military and defence aspects of space policy which is notable given that the EU has traditionally mandated strictly peaceful actions.

The analysis in this study also supported the notion by Kalligas (2006) that once a course on the integration of military and civil aspects of space policy has been taken, it is difficult to change as the process is irreversible. According to HI, this is the path that develops in line with its logic while some random and unpredictable events may still influence this process.

### **5.3. Perspectives on UK Space Policy in Light of Brexit**

While the UK has declared its ambitions to become an independent and significant space power in the international arena, it is difficult to predict how Brexit will influence the UK's future role in the industry and within its space policy. HI is in addition unable either to fully predict the outcomes of current processes or to rank them by significance. One possible scenario is that the UK will be able to become an intermediary between the US and the EU since it maintains relationships with both sides. In this sense, it is feasible to agree with Gaskarth (2014) who claimed that the UK's future role mostly depends on identity and capabilities rather than on its geographical position. Another possible future scenario could involve the UK's further isolation and a focus on national projects with decreasing powers in the global arena. Permanent budget deficits and the UK's reluctance to accept small-scale roles in favour of leadership positions in international space programmes suggest the likelihood of such a scenario. However, there have been recent exceptions such as the deal with Australia that put this potential scenario in doubt (Australian Govt. 2021). The space industry no longer belongs just to the US and Russia. At a minimum, India and China are increasing their presence in space and their ambitions, along with others, should be accounted for. As for the EU, it is likely to follow its chosen path to autonomy. Its influence and power will likely increase as the significance of a space presence and formalised space policies become better understood globally.



## 6. Conclusion

### 6.1. Summary of the Study

The research aimed to investigate how the relationships between the UK and EU in the space security sphere developed. The objectives of the study were to indicate the nature of HI and to examine space security policies through the lens of this theory. The secondary objective was then to explore the history of EU-UK relationships in the space security policy domain through the lens of HI.

With regards to the first objective, it is important to say that HI as a theory examines historical processes in two dimensions, namely over time and through institutionalisation, that is the development of “the rules of the game” and their formal norms. HI employs a set of unique concepts including critical junctures, unintended consequences, increasing positive or negative returns. It asserts that historical processes are mostly non-deterministic as they combine a share of purely deterministic processes with random events. HI was shown to be more appropriate for the analysis compared to RCT and SI because it considered both dynamics (development in time) and the role of institutions and processes. Both the RCT and SI cannot capture changes along the two dimensions including structural breaks and temporal changes. RCT can't explain the formation of institutions. The literature review showed that RCT performed poorly in the conditions of uncertainty. SI fails to interpret institutions as solid structures and coherently explain state policies. This is because SI does not view state policies as products of social agreements and traditions.

Space policy was shown to emerge in post-war Europe with the UK claiming a leading role in the space sector as it was the least affected of the major European powers. However, its sole space project Blue Streak failed due to a lack of funding and to overestimated technical calculations of its missile range capabilities. Not willing to lose the already invested funds, the UK turned to Europe seeking a partnership. The UK faced the dilemma of choosing between partners for their project at that moment. Their choice was either a resurgent France and Germany amongst other major European countries or with the US. The choice was made in favour of its European allies. However, within Europe there was a reluctance, particularly with

France, to closely partner with the US as they did not want to depend on the USA but rather continued to seek European autonomy in space affairs. Although the UK was a co-founder of the first European space organisations, ELDO and ESRO, it started to oppose Europe's main actors, France and Germany, following President de Gaulle's vetoes on the UK application to enter the EEC. Since then, the relationships between the UK and other European countries have cooled down. As a result, Britain withdrew from ESA in the 1980s. In the 2000s, the UK focused on its autonomy in space affairs and developed its space policy. Withdrawal from the EU after the Brexit vote also triggered the withdrawal of the UK from the international space programme Galileo. In general, although the paths of the UK and EU intersected for several decades in the 20<sup>th</sup> century, both sides continued to seek autonomy in terms of developing space policies.

In light of HI, the development of the European space industry and the UK's and EU's space policies was not a purely deterministic process as several random events, or critical junctures in the HI's terminology entailed unintended results. Among critical junctures was the Churchill speech that predetermined the UK's priorities, refusal of France to vote for UK's membership in EEC, the Kosovo accident that led to the decision to develop an autonomous European satellite infrastructure, failure of the Galileo PPP which put the programme under significant influence of the EU and Brexit. While HI was productive for analysing the outcomes of past events and estimating their significance, it is unable to predict future processes given the current inputs. The splicing of the military and civil aspects of space defence policies of both the EU and the UK is also a path that was once chosen and is developing now.

In general, it is noteworthy that the literature on the use of HI for explaining space policies is scarce as the field itself is relatively new and other authors in the field have generally not applied formalised theoretical frameworks to their research as yet. Therefore, the attained results contribute to the body of literature significantly.

## **6.2. Limitations of the Research**

Despite the obtained insights on the EU-UK relationships in terms of space policy and revealed proof of HI feasibility for such an analysis, the study has several limitations that have to be underlined as well.

First, limitations are connected with the choice of HI as the theoretical framework. As stated above, its main limitation is that being effective for analysing previous events, it is almost helpless in predicting future perspectives and estimating possible scenarios. Therefore, at the moment being, it is hard to predict how the EU and UK space policies will be developing in the future. What is important, HI is unable to estimate the probabilities of these scenarios, and other instruments should be employed for conducting such an analysis. In addition, HI is not always capable of switching between two equally used concepts of institutions, namely institutions as processes and institutions as rigid structures of norms and regulations. Finally, HI is weak in distinguishing between different strategies being implemented at a time and the vectors of actors' efforts. Instead, HI focuses on only one path and analysis its development over time.

The second group of limitations is connected with the chosen research method. Qualitative analysis that employs secondary data has its restrictions. While it explores the research topic in detail and admits the researcher's explanation of the interpretation of the collected data, it is unable to estimate the significance of the attained results which can be done in the quantitative analysis. An indirect method of outcomes verification is the comparison of data from different sources to gain triangulation. The present study used secondary data from various sources and has not obtained contradictory results. However, the significance of the results is to be verified by time. We have extended the research by Sigalas (2017) on the UK space policy as well to more clearly show the intersections between the UK and the EU policies.

Finally, a limitation of the study is that only secondary data were used for the analysis. Sigalas (2017) whose study was taken as a benchmark and a starting point of the research combined secondary and primary data from ESA and EU experts. Not only did this allow for gaining data triangulation but also for receiving deeper

insights on the development of the EU's space security policy. There was less opportunity for the author to communicate with such experts given the timing of the study during the networking and meeting restrictions imposed by the Covid-19 pandemic. This may reflect in the quality of the analysis.

### **6.3. Recommendations for Further Research**

The recommendations for further research partly stem from the limitations of the present study. First, it might be useful to explore the same topic through the lenses of other theories such as SI or functional institutionalism. After that, the outcomes of the studies can be compared which would allow for additional verification of results.

Second, quantitative methods might be used in further research as well. It might be difficult to find relevant data partly because of its secrecy and partly because of the difficulty of formulating relevant research hypotheses. However, conducting such an analysis would also contribute to the knowledge on the topic.

Third, different aspects of space policy can be explored. The splicing of military and civil aspects of space policy can be paid more attention to in further research. The perspectives of the European space sector after Brexit are another intriguing topic. In general, the EU space policy is a broad and complex topic so that there are numerous future directions for further research.

## References

Acemoglu, D. and Robinson, J. A. (2006) *Economic origins of dictatorship and democracy*, Cambridge, UK: Cambridge University Press.

Acemoglu, D., Johnson, S. and Robinson, J. A. (2001) The colonial origins of comparative development: An empirical investigation, *The American Economic Review*, 91 (5), pp. 1369–1401.

Adriaensen, M., Giannopapa, C., Sagath, D. and Papastefanou, A. (2015) Priorities in national space strategies and governance of the member states of the European Space Agency. *Acta Astronautica*, 117, pp.356-367.

Aldrich R (2010) *GCHQ: the uncensored story of Britain's most secret intelligence agency*. Harper Press, London.

Al-Ekabi, Cenan (Ed.) (2015) *European Autonomy in Space*, New York: Springer.

Arrow, K. J. (2012) *Social choice and individual values* (3<sup>rd</sup> ed.) New Haven: Yale University Press.

Arthur, W. B. (1994) *Increasing returns and path dependence in the economy. Economics, Cognition, and Society*. Ann Arbor: University of Michigan Press.

Australian Government (2021) Space Bridge to unite Australia and UK space industries. Available at: <https://www.industry.gov.au/news/space-bridge-to-unite-australia-and-uk-space-industries>. [Accessed on: 16/07/2021].

Baker, D. and D. Seawright (eds.) (1998) *Britain for and Against Europe: British Politics and the Question of European Integration*, Oxford: Oxford University Press.

Baylis, J. (1995) *Ambiguity and Deterrence: British nuclear strategy, 1945-1964* (No. 4). Oxford University Press.

Beclard, J. (2013) With the head in the air and the feet on the ground: the EU's actorness in international space governance, *Global Governance: A Review of Multilateralism and International Organizations*, 19(3), pp. 463-479.

Bell, L. (1995) *The Throw that Failed: Britain's original application to join the Common Market*, London: New European Publications.

Bengtsson, M. (2016) How to plan and perform a qualitative study using content analysis. *Nursing Plus Open*, 2 (2), pp. 8-14.

Bennett, G. (2021) What's the Context? Winston Churchill's 'Sinews of Peace' speech, Fulton, 5 March 1946. Available at: <https://history.blog.gov.uk/2021/03/05/whats-the-context-winston-churchills-sinews-of-peace-speech-fulton-5-march-1946/>. [Accessed: 08/07/2021]

Bickerton, C.J., Irondelle, B. and Menon, A. (2011) *Security Co-operation beyond the Nation-State: The EU's Common Security and Defence Policy*.

BNSC (2008) *UK Civil Space Strategy: 2008-2012 and beyond*, British National Space Centre.

Boje, D.M. (2001) *Narrative Methods for Organisational and Communication Research*, Thousand Oaks, CA: SAGE.

Bowen B. (2020) British Spacepower: Context, Policies, and Capabilities. In: Schrogl, K.U. (eds) *Handbook of Space Security*, pp. 1365-1379, Cham: Springer.

Bowen, B. (2020) The Integrated Review and UK Spacepower: The Search for Strategy, Freeman Air and Space Institute, Available at: <https://www.kcl.ac.uk/security-studies/assets/kcl-fasi-british-spacepower-and-the-integrated-review-web4.pdf>, [Accessed on 05/06/2021].

Bowen, B. E. (2018) British strategy and outer space: a missing link? *British Journal of Politics and International Relations*, 20(2), pp. 323-340.

Bowen, B. E. (2020) *War in Space: Strategy, Spacepower, Geopolitics*, Edinburgh: Edinburgh University Press.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology, *Qualitative Research in Psychology*, 3(2), pp. 77-101.

Brearley, A., Quaggiato, V. and Mosteshar, S. (2013) Space security seminar at the London Institute of Space Policy and Law (ISPL), Available at: [https://www.space-institute.org/app/uploads/1383240799\\_Space\\_Security\\_Seminar\\_at\\_the\\_London\\_Institute\\_of\\_Space\\_Policy\\_and\\_Law.pdf](https://www.space-institute.org/app/uploads/1383240799_Space_Security_Seminar_at_the_London_Institute_of_Space_Policy_and_Law.pdf), [Accessed on 17/05/2021].

Butler, S. A. (2016) National prestige and in(ter)dependence: British space research policy 1959-73, A thesis submitted to The University of Manchester for the degree of Doctor of Philosophy in the Faculty of Biology, Medicine and Health School of Biological Sciences.

Cakir, T., (2021) International Cooperation as an Essential Part of the Galileo Programme. In *Legal Aspects Around Satellite Constellations* (pp. 161-177). Springer, Cham.

Calvert, R. L. (1995) Rational actors, equilibrium, and social institutions. In: J. Knight and I. Sened (Eds.) *Explaining social institutions*, pp. 57–94. Ann Arbor: University of Michigan Press.

CEC (1988) Communication from the Commission on the Community and space: a coherent approach, COM (88) 417.

CEC (1991) Crossroads in space, A Report by an Independent Advisory Panel.

Clarke, M. (1998) Britain. In *NATO and Collective Security* (pp. 6-38). Palgrave Macmillan, London.

Clemens, E. S. and Cook, J. M. (1999) Politics and institutionalism: Explaining durability and change, *Annual Review of Sociology*, 25, pp. 441–466.

CoA (2009) The Management of the Galileo Programme's Development and Validation Phase, Council of Advocates Special Report 7/2009.

Coffey, A. and Atkinson, P. (1996) *Making Sense of Qualitative Data*. Thousand Oaks, CA: Sage.

Collier, D., & Munck, G. L. (2017) Building blocks and methodological challenges: A framework for studying critical junctures. *Qualitative and Multi-Method Research*, 15(1), 2-8.

Comfort, N. (2012) *Surrender: How British industry gave up the ghost 1952-2012*. Biteback Publishing.

Copernicus (2017) Copernicus Security Service, Available at: <http://copernicus.eu>, [Accessed on 13/06/2021].

Copernicus (2021) State of Play: Copernicus Services for Security Applications, Available at: <https://insitu.copernicus.eu/state-of-play/copernicus-services-for-security-applications>, [Accessed on 13/06/2021].

Cowles, M. G. and S. Curtis (2004) Developments in European Integration Theory: The EU as 'Other', in: M. G. Cowles and D. Dinan (eds.) *Developments in the European Union 2*, Basingstoke: Palgrave, pp. 296-309.

Davis, B.G. and Ebinama, J., (2021) From History to Tomorrow: Space Programs in Africa. In *AIAA Scitech 2021 Forum* (p. 1111).

Deighton, A. (2006) *British-West German relations, 1945-1972*, in: K. Larres, and E. Meehan, (eds) *Uneasy Allies: British-German relations and European integration since 1945*, Oxford: Oxford University Press.

Della Libertà, P.M. and Viminario-Padova, S.P. (2018) IN SEARCH OF A THEORY FOR PESCO. A thesis submitted in partial fulfilment for the degree of MA in EU Studies, Institute of European and International Studies, Nic.

De Maria, M. and Krige, J. (1992) Early European attempts in launcher technology: Original sins in Eldo's sad parable. *History and Technology, an International Journal*, 9(1-4), pp.109-137.

Department for Business, Energy & Industrial Strategy, UK Space Agency, and The Rt Hon Andrea Leadsom MP (28 November 2019) *UK invests in European Space Agency programmes*. Available at: <https://www.gov.uk/government/news/uk-invests-in-european-space-agency-programmes> [Accessed on: 16/06/2021].



Dewar, R.S. (2017) Cybersecurity in the European Union: a historical institutionalist analysis of a 21st-century security concern (Doctoral dissertation, University of Glasgow).

DIA (2019) Challenges to Security in Space, Defence Intelligence Agency Report, Available at: [https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Space\\_Threat\\_V14\\_020119\\_sm.pdf](https://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Space_Threat_V14_020119_sm.pdf), [Accessed on 13/06/2021].

DiMaggio, P. J. and Powell, W. W. (1983) The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields, *American Sociological Review*, 48 (6), pp. 147–160.

Dobbin, F. (1994) *Forging industrial policy: The United States, Britain, and France in the railway age*. Cambridge, UK: Cambridge University Press.

Downs, A. (1957) An economic theory of political action in a democracy, *Journal of Political Economy*, 65 (4), pp. 135–150.

Dupas, A., Janichewski, S., von Kries, W. and Schrogl, K.U. (2001) A Franco-German view of Europe's ambition in space for the 21st century. *Space Policy*, 17(2), pp.103-110.

EC (1994) Satellite navigation services: a European approach, COM (94) 248.

EC (1996) The European Union and space: fostering applications, markets and industrial competitiveness, Communication from the Commission to the Council and European Parliament, COM (96) 617.

EC (n.d.) Galileo, Available at: [https://ec.europa.eu/growth/sectors/space/galileo\\_en](https://ec.europa.eu/growth/sectors/space/galileo_en), [Accessed on 13/06/2021].

EC (2021) ECMWF Copernicus services - General Q&As Available at: <https://atmosphere.copernicus.eu/ecmwf-copernicus-services-general-qas> [Accessed on 14/06/2021]

EEA (2021) Copernicus – Monitoring Earth from space and the ground, European Environment Agency, Available at: <https://www.eea.europa.eu/signals/signals-2019-content-list/articles/copernicus-monitoring-earth-from-space>, [Accessed on 13/06/2021].

EP (1979) Resolution on Community participation in space research, OJ C/42.

EP (1981) Resolution on European space policy, OJ C/102

EP (1987) Resolution on European space policy, OJ C/78

EP (1991) Resolution on European space policy, OJ C/305

EP (2020) The European space sector as an enabler of EU strategic autonomy, Policy Department, Directorate-General for External Policies of the European Parliament, Available at: [https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/653620/EXPO\\_IDA\(2020\)653620\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2020/653620/EXPO_IDA(2020)653620_EN.pdf), [Accessed on 17/05/2021].

Erlingsson, C. and Brysiewicz, P. (2013) Orientation among multiple truths: An introduction to qualitative research, *African Journal of Emergency Medicine*, 3(2), pp. 92-99.

ESA (2021) ESA Member States, Canada, Latvia, Lithuania and Slovenia, Available at: [http://www.esa.int/Education/ESA\\_Member\\_States\\_Canada\\_Latvia\\_Lithuania\\_and\\_Slovenia#:~:text=ESA%20Member%20States%3A%20Austria%2C%20Belgium,Switzerland%20and%20the%20United%20Kingdom.](http://www.esa.int/Education/ESA_Member_States_Canada_Latvia_Lithuania_and_Slovenia#:~:text=ESA%20Member%20States%3A%20Austria%2C%20Belgium,Switzerland%20and%20the%20United%20Kingdom.), [Accessed on 13/06/2021].

ESA (n.d.) Galileo Partners, Available at: [www.esa.int](http://www.esa.int), [Accessed on 13/06/2021].

EUSPA (2019) Latest batch of Galileo satellites enters service, Available at: <https://www.euspa.europa.eu/newsroom/news/latest-batch-galileo-satellites-enters-service>, [Accessed on 17/05/2021].

Farrell, H. (2018) The shared challenges of institutional theories: Rational choice, historical institutionalism, and sociological institutionalism. In *Knowledge and institutions* (pp. 23-44). Springer, Cham.

Feyerer, J. (2015) Lessons from Galileo for future European public-private partnership in the space sector, in: T.C Hoerber, P. Stephenson (eds.) *European Space Policy -European integration and the final frontier*, London: Routledge, pp. 211-222.

Fioretos, O. (2011) Historical institutionalism in international relations. *International Organization*, 65(2), pp.367-399.

Fligstein, N. and McAdam, D. (2012) *A theory of fields*, Oxford, UK: Oxford University Press.

Folescu, C. (2016). *Surpassing the Leaders-Laggards gap? Conditionality, Compliance and Europeanisation viewed from Romania and Bulgaria in the post-accession period* (Doctoral dissertation, Durham University).

Foreign, Commonwealth and Development Office. (2020) Agreement in the form of an Exchange of Notes between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America on Technology Safeguards associated with United States Participation in Space Launches from the United Kingdom. [Online] Command Paper No 307. London: HM Stationery Office. Date Accessed: 15/06/2021, Available from: <https://www.gov.uk/government/publications/ukusa-agreement-in-the-form-of-an-exchange-of-notes-between-the-united-kingdom-and-the-united-states-of-america-on-technology-safeguards-associated>

Formicola, B. (2020) The European Space Policy: assessing its contribution to the EU's Common Security and Defence Policy through the lenses of neo-functionalism, A thesis submitted in partial fulfilment for the degree of MA in International Relations, University of Leiden.

Furby, D.E. (2010) *The revival and success of Britain's second application for membership of the European Community, 1968-71* (Doctoral dissertation, Queen Mary University of London).

Gaskarth, J. (2014) Strategising Britain's role in the world, *International Affairs*, 90 (3), pp. 559-581.

Georgescu, C.M. (2014) Europeanization theories revisited through historical institutionalism. EU as a public policy role model for post-communist South-Eastern Europe in the field of security. *Revista de Științe Politice. Revue des Sciences Politiques*, (42), pp.135-146.

Geppert, A.C., Brandau, D. and Siebeneichner, T. eds., (2021) *Militarizing outer space: Astroculture, dystopia and the Cold War*. Palgrave Macmillan.

Gerth, H. H. and Mills, C. W. (Eds.) (2009) *From Max Weber: Essays in sociology* (H. H. Gerth and C. W. Mills, Trans.), London: Routledge.

Gould, S. J. and Eldredge, N. (1977) Punctuated equilibria: The tempo and mode of evolution reconsidered, *Paleobiology*, 3(3), pp. 115–151.

Graftstein, R. (1992) *Institutional Realism: Social and Political Constraints on Rational Actors*, New Haven, CT: Yale University Press.

Gray, C.S., (1982) *American Military Space Policy: Information Systems, Weapon Systems, and Arms Control*. Abt Books.

Greif, A. (1994) Cultural beliefs and the organization of society: a historical and theoretical reflection on collectivist and individualist societies, *Journal of Political Economy*, 102(5), pp. 912-950.

Greif, A. (2006) *Institutions and the path to the modern economy: Lessons from medieval trade*. Cambridge, UK: Cambridge University Press.

Greif, A. and Laitin, D. D. (2004) A theory of endogenous institutional change, *American Political Science Review*, 98 (5), pp. 633–652.

Greif, A. and Kingston, C. (2011) Institutions: Rules or Equilibria? In: Schofield, N. and Caballero, G. (eds.) *Political Economy of Institutions, Democracy and Voting*, Berlin: Springer.

Gstöhl, S. and Phinnemore, D. (2021) The future EU-UK partnership: a historical institutionalist perspective. *Journal of European Integration*, 43(1), pp.99-115.

Hacker, J. S., Thelen, K. and Pierson, P. (2013) *Drift and conversion: Hidden faces of institutional change*. [APSA 2013 Annual Meeting Paper]. Chicago: American Political Science Association.

Harvey, B. (2003) *Europe's Space Programme: To Ariane and Beyond*, Chichester, UK: Springer.

Heinlein, F. (2002) *British Government Policy and Decolonisation 1945-1963: Scrutinising the Official Mind*, London: Frank Cass.

Hicks CB, C. (2009) History of UK contribution to astronautics: Politics and government. *Acta Astronautica*, 65(11-12), pp. 1593-1598.

Hill, C.N. (2001) *Vertical Empire, A: The History Of The UK Rocket And Space Programme, 1950-1971*. World Scientific.

HM Government (n.d.) National Space Policy, Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/484865/NSP\\_-\\_Final.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/484865/NSP_-_Final.pdf), [Accessed on 17/05/2021].

Hobe, S., Schmidt-Tedd, B. and Schrogl, K.-U. (2006) *Project 2001 Plus - Global and European Challenges for Air and Space Law at the Edge of the 21st Century*. In: Publications on air and space law, Carl Heymanns Verlag.

Hobsbawm, E. (2009) *On empire: America, war, and global supremacy*, New York: Random House.

Hoerber, T. (2016) Creating ESA, In: Al-Ekabi, C., Baranes, B., Hulsroj, P., Lahcen, A. (Eds.), *Yearbook on Space Policy: The Governance of Space 2014*, pp. 243-254, Vienna: Springer-Verlag.

Hoerber, T. and Lieberman, S. (eds.) (2019) *A European Space Policy: Past Consolidation, Present Challenges and Future Perspectives*, London: Routledge.

Hoerber, T. and Stephenson, P. (2015) Lessons from Galileo for future European public-private partnerships in the space sector. In *European Space Policy* (pp. 239-251). Routledge.

House of Commons Debate on the European Economic Community (2<sup>nd</sup> August 1961). Hansard, vol. 645, col 1480-1606. Available at: <https://api.parliament.uk/historic-hansard/commons/1961/aug/02/european-economic-community>, [Accessed on 15th of July, 2021].

House of Commons debate on UK Space Plan (4 November 1987) Hansard, vol. 121, Column 1039. Available at: <https://hansard.parliament.uk/Commons/1987-11-04/debates/07b13e70-5a5d-455d-8063-8d7c96584d4c/UnitedKingdomSpacePlan>, [Accessed on 17<sup>th</sup> June 2021].

Hristov, A. (2019) Historical Institutionalism Meets IR: Explaining Patterns in EU Defence Spending, Available at: <https://www.e-ir.info/2019/02/03/historical-institutionalism-meets-ir-explaining-patterns-in-eu-defence-spending/>, [Accessed on 13/06/2021].

Inglehart, R. and Baker, W. E. (2000) Modernisation, cultural change and the persistence of traditional values, *American Sociological Review*, 65, pp. 19-51.

Ioannou, D., Leblond, P. and Niemann, A. (2015) European integration and the crisis: practice and theory.

Jiang, S. and Zhao, Y. (2021) China's National Space Station: Opportunities, Challenges, and Solutions for International Cooperation. *Space Policy*, 57, p.101439.

Jeandesboz, J. (2016) Smartening border security in the European Union: an associational inquiry, *Security dialogue*, 47 (4), pp. 292-309.

Jepperson, R. L. (2002) The development and application of sociological neo-institutionalism. In J. Berger and M. Zelditch (Eds.) *New directions in contemporary sociological theory* (pp. 229–266). Lanham: Rowman and Littlefield.

Johnson-Freese, J. (2007) *Space as a strategic asset*. Columbia University Press.

Jones, S. G. (2007) *The rise of European security cooperation*. Cambridge, U.K.: Cambridge University Press.

Kalligas, K. (2006) A Historical Institutional Analysis of the Security and Defence Policy of the European Union, A thesis submitted in partial fulfilment for the degree of MA in International Relations, University of Warwick, Department of Politics and International Studies.

Kennedy, G. P. (1983) *Vengeance Weapon 2: The V-2 Guided Missile*. Washington, DC: Smithsonian Institution Press.

Klijn, E.H. and Koppenjan, J.F. (2006) Institutional design: changing institutional features of networks. *Public management review*, 8(1), pp.141-160.

Kolovos, A., 2002. Why Europe needs space as part of its security and defence policy. *Space Policy*, 18(4), pp.257-261.

Kostova, T., K. Roth and M. Tina Dacin (2008) Institutional Theory in the Study of Multinational Corporations: A Critique and New Directions, *The Academy of Management Review*, 33 (4), pp. 994-1006.

Krasner, S. D. (1982) Regimes and the limits of realism: Regimes as autonomous variables. *International Organisation*, 36 (4), pp. 497-510.

Krige, J. and A. Russo (2000) *A History of the European Space Agency 1958 - 1987: Volume I The story of ESRO and ELDO, 1958 - 1973*, Noordwijk: ESA Publications Division ESTEC.

Kvale, S. (1996) *InterViews*. Thousand Oaks, CA: Sage.

Lahcen, A. and Andrijasevic, D. (2021) Space Policy: Understanding Space Activities, Motivations and Programs. In *Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport* (pp. 28-63). IGI Global.

Levi, M. (2013) Can nations succeed? *Perspectives on Politics*, 11 (3), pp. 187-192.

Lockwood, M., Kuzemko, C., Mitchell, C. and Hoggett, R. (2017) Historical institutionalism and the politics of sustainable energy transitions: a research agenda, *Environment and Planning C: Politics and Space*, 35 (2). pp. 312-333.

Logsdon, J.M. (2015) *After Apollo?: Richard Nixon and the American Space Program*. Springer.

Lundestad, G. (2010) *East, West, North, South: International Relations since 1945*, 7th ed., London: Sage.

Madders, K. and Thiebaut, W. (2007) Carpe diem: Europe must make a genuine space policy now. *Space Policy*, 23(1), pp.7-12.

Mahoney, J. and Schensul, D. (2006) Historical Context and Path Dependence, in: R. E. Goodin and C. Tilly, (eds.) *Oxford Handbook of Contextual Political Analysis*, Oxford: Oxford University Press.

Marten, K. (2018) Reconsidering NATO expansion: a counterfactual analysis of Russia and the West in the 1990s. *European Journal of International Security*, 3(2), pp.135-161.

Massey, H. (1986) *History of British space science*. Cambridge: Cambridge University Press.

Mayo, M. (2005) *Global citizens: Social movements and the challenge of globalisation*, London: Zed Books.

Mazurelle, F., Thiebaut, W. and Wouters, J. (2009) The Evolution of European Space Governance: Policy, Legal and Institutional Implications, *International Organisations Law Review*, 6 (1), pp. 155-189.

McCormick, P. (2015) Space situational awareness in Europe: The fractures and the federative aspects of European space efforts. *Astropolitics*, 13(1), pp.43-64.

McDougall, W.A. (1985) Space-Age Europe: Gaullism, Euro-Gaullism, and the American Dilemma. *Technology and Culture*, 26(2), pp.179-203.

McDougall, W. A. (1997) *...the Heavens and the Earth: A Political History of the Space Age Paperback*, Maryland: John Hopkins University Press.

McKelvey, R. D. (1976) Intransitivities in multidimensional voting models and some implications for agenda control, *Journal of Economic Theory*, 12 (6), pp. 472-482.



McKelvey, R. D. (1979) General conditions for global intransitivities informal voting models, *Econometrica: Journal of the Econometric Society*, 47 (11), pp. 1085–1112.

Meyer, J. W. and Rowan, B. (1977) Institutionalised organisations: Formal structure as myth and ceremony, *American Journal of Sociology*, 83, pp. 340–363.

Meyer, J. W., Boli, J., Thomas, G. M. and Ramirez, F. O. (1997) World society and the nation-state, *American Journal of Sociology*, 103 (5), pp. 144–181.

Milgrom, P. R., North, D. C. and Weingast, B. R. (1990). The role of institutions in the revival of trade: The law merchant, private judges, and the champagne fairs, *Economics and Politics*, 2 (2), pp. 1–23.

Millard D. (2018) A Grounding in Space: Were the 1970s a Period of Transition in Britain's Exploration of Outer Space? In: Geppert A. (eds) *Limiting Outer Space*, pp. 79-99. Palgrave Studies in the History of Science and Technology. London: Palgrave Macmillan.

Mischler, E.G. (1985) *Research Interviewing: Context and Narrative*, Cambridge, MA: Harvard University Press.

Morisse-Schilbach, M. (2006) Historical Institutionalism, in: H.- J. Bieling and M. Lerch (eds.) *Theories of European Integration*, Wiesbaden: VS Verlag, pp. 271-292.

Morris, J. (2011) How Great is Britain? Power, Responsibility and Britain's Future Global Role, *The British Journal of Politics and International Relations*, 13(3), pp. 326-347.

Morrow, D. (2013) Self and Other in Northern Ireland: The Challenge of Ethical Leadership in an Ethnic Conflict. *The International Journal of Ethical Leadership*, 2(1), p.157.

Morton, P. (1989) *Fire across the desert: Woomera and the Anglo-Australian Joint Project 1946-1980*. Canberra, ACT: AGPS Press.

Moustakas, C. (1994) *Phenomenological Research Methods*. Thousand Oaks, CA: Sage.

Musson, G. (2004) Life histories, In: C. Cassell and G. Symon (eds) *Essential Guide to Qualitative Methods in Organizational Research*. London: Sage, pp. 34-44.

Napel, S. and Widgrén, M. (2006) The inter-institutional distribution of power in EU codecision. *Social Choice and Welfare*, 27(1), pp.129-154.

Nilsson, J. (2018) *What logics drive the choices of public decision-makers?* (Doctoral dissertation, Luleå tekniska universitet).

North, D. C. (1990) *Institutions, institutional change and economic performance. The Political Economy of Institutions and Decisions*. Cambridge, UK: Cambridge University Press.

North, D. C., Wallis, J. J. and Weingast, B. R. (2009) *Violence and social orders: A conceptual framework for interpreting recorded human history*, Cambridge, UK: Cambridge University Press.

NSS (2008) The National Security Strategy of the United Kingdom: Security in an interdependent world, Cabinet Office, Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/228539/7291.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228539/7291.pdf), [Accessed on 05/06/2021].

NSS (2009) The National Security Strategy of the United Kingdom: Update 2009 Security for the Next Generation, Cabinet Office, Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/229001/7590.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/229001/7590.pdf), [Accessed on 05/06/2021].

NSS (2010) The National Security Strategy of the United Kingdom: Update 2010 A Strong Britain in an Age of Uncertainty, Cabinet Office, Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/61936/national-security-strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/61936/national-security-strategy.pdf), [Accessed on 14/07/2021].

Oikonomou, I. (2017) 'All u need is space': Popularizing EU space policy. *Space Policy*, 41, pp.5-11.

Ollis, T. (2011) Learning in social action: The informal and social learning dimensions of circumstantial and lifelong activists, *Australian Journal of Adult Learning*, 51 (2), pp. 248-268.

Olsen, J.P. (2010) *Governing Through Institution Building. Institutional Theory and Recent European Experiments in Democratic Organisation*. Oxford: Oxford University Press.

Osborne, M. J. (2004) *An Introduction to Game Theory*. Oxford: Oxford University Press.

Ostrom E. (1995) New horizons in institutional analysis, *American Political Science Review*, 89(1), pp. 174-178.

Pagedas, C. (2000) *Anglo-American Strategic Relations and the French Problem, 1960-63*, London: Routledge.

Paikowski, D. (2017) *The Power of the Space Club*, Cambridge: Cambridge University Press.

Parsonson, A. (2020) ESA requests €230 million more for Ariane 6 as maiden flight slips to 2022, Available at: <https://spacenews.com/esa-request-230-million-euros-more-for-ariane-6-as-maiden-flights-slips-to-2022/>, [Accessed on 13/06/2021].

Peden. G. C. (2007) *Arms, Economics, and British Strategy: From Dreadnoughts to Hydrogen Bombs*. Cambridge: Cambridge University Press.

Petroni, G., Bigliardi, B., Galati, F. and Petroni, A. (2018) Which benefits and limits derive from ESA membership for European Countries owning “medium-sized” space agencies?. *Acta Astronautica*, 142, pp.130-137.

Pierson, P. (1996) ‘The Path to European Integration: A Historical Institutional Analysis’, *Comparative Political Studies*, 29 (2), pp. 123-163.

Pierson, P. (1998) The Path to European Integration: A Historical Institutional Analysis, in: W. Sandholtz and A. S. Sweet (eds.) *European Integration and Supranational Governance*, Oxford: Oxford University Press, pp. 27-58.

Pierson, P. (2000) Increasing returns, path dependence, and the study of politics, *American Political Science Review*, 94, pp. 251–267.

Piris, J.C. (2010) *The Lisbon Treaty: a legal and political analysis*. Cambridge University Press.

Plattard, S. (2008) What's the problem with Europe's flagships Galileo and GMES?. In *Yearbook on Space Policy 2006/2007* (pp. 153-166). Springer, Vienna.

Polkowska, M. (2020) Space Defence in Europe. Policy and Security Aspects, *Polish Political Science Yearbook*, 49(2), pp. 127-139.

Porter P (2010) Why Britain doesn't do grand strategy. *RUSI Journal*, 155(4), pp. 6-12.

Posen, B. (2003) Command of the Commons: The Military Foundation of U.S. Hegemony, *International Security*, 28 (1), pp. 5-46.

Praet, P. (15<sup>th</sup> May 2019) On the importance of institutions as provider of stability and protection in an uncertain world. *Steptoe Brussels Open Conference Series*, Brussels.

Przeworski, A. (2004) Institutions matter? *Government and Opposition*, 39, pp. 527–540.

PWC (2001) Inception Study to Support the Development of a Business Plan for the Galileo Programme, Prepared at the special request of DG TREN.

Quintana, E. (2017) The New Space Age, *The RUSI Journal*, 162 (3), pp. 88-109.

Reillon, S. (2017) European Space Policy: Historical perspective, specific aspects and key challenges, Available at: [https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_IDA\(2017\)595917](https://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_IDA(2017)595917), [Accessed on 13/06/2021].

Remmer, K. L. (1997) Theoretical decay and theoretical development: the resurgence of institutional analysis, *World Politics*, 50(1), pp. 34-61.

Riessman, C. K. (2005) Narrative Analysis. In: Narrative, Memory and Everyday Life. Huddersfield: the University of Huddersfield, pp. 1-7.

Riker, W. H. (1980) Implications from the disequilibrium of majority rule for the study of institutions. *American Political Science Review*, 74, pp. 432–446.

Rixen, T. and Viola, L.A. (2016) Historical institutionalism and international relations: towards explaining change and stability in international institutions.

Rokkan, S. (1999) *State formation, nation-building, and mass politics in Europe: the theory of Stein Rokkan: based on his collected works*, Oxford: Clarendon Press.

Rose, H. and Rose, S. (1969) *Science and Society*. London: The Penguin Press.

Rough, E., E. Kirk-Wade, A. Adcock and C. Housley (2021) Future of the UK Space Industry, Available at: <https://researchbriefings.files.parliament.uk/documents/CDP-2021-0006/CDP-2021-0006.pdf>, [Accessed on 13/06/2021].

Rubenstein, W. D. (2015) *Capitalism, Culture, and Decline in Britain, 1750-1990*, London: Routledge.

Schilde, K. and Goodman, S.W. (2021) The EU's Response to the Migration Crisis: Institutional Turbulence and Policy Disjuncture. In *The Palgrave Handbook of EU Crises* (pp. 449-468). Palgrave Macmillan, Cham.

Schmidt, V. A. (2012) A curious constructivism: A response to Professor Bell, *British Journal of Political Science*, 42, pp. 705–713.

Schneiberg, M. and Clemens, E. S. (2006) The typical tools for the job: Research strategies in institutional analysis, *Sociological Theory*, 24 (4), pp. 195–227.

Schofield, N. (1978) Instability of simple dynamic games. *The Review of Economic Studies*, 45 (7), 575–594

Schofield, N. and G. Caballero (Eds.) (2011) *Political Economy of Institutions, Democracy and Voting*, Berlin: Springer, pp. 13-43.

Schout, A., Zandee, D., Wouters, Z. and Muhlfellner, J. (2019) From the 'Ordinary' Method to the Transgovernmental Method - Comparative Trends in EU Governance, Clingendael Report, Available at: [https://www.clingendael.org/sites/default/files/2019-07/Comparative\\_Trends\\_in\\_Governance\\_July\\_2019\\_0.pdf](https://www.clingendael.org/sites/default/files/2019-07/Comparative_Trends_in_Governance_July_2019_0.pdf) [Accessed on 13/06/2021].

Sen A. (1997) Inequality, Unemployment and Contemporary Europe, *International Labour Review*, 14 (5), pp. 136-150.

Sheehan, M. (2007) *The International Politics of Space*, New York: Routledge.

Sheehan, M. (2021) West European Integration and the Militarization of Outer Space, 1945-70. In *Militarizing Outer Space* (pp. 93-116). Palgrave Macmillan, London.

Shepsle, K.A. (1979) The role of institutional structure in the creation of policy equilibrium. *Public policy and public choice*, 6, pp.249-83.

Shepsle, K. A. (1986) Institutional equilibrium and equilibrium institutions. In: H. F. Weisberg (Ed.) *Political science: The science of politics* (pp. 51-81). New York: Agathon Press.

Sigalas, E. (2012) The role of the European parliament in the development of a European union space policy. *Space Policy*, 28(2), pp.110-117.

Sigalas, E. (2016) The Rise of the European Union as a Space Power: A Historical Institutional Explanation, in: T. C. Hoerber and E. Sigalas (eds.) *Theorizing European Space Policy*, Lexington Books.

Sigalas, E. (2017) The European Union Space Policy, Oxford Research Encyclopaedia of Politics, Available at: <https://doi.org/10.1093/acrefore/9780190228637.013.183> [Accessed on 17/05/2021].

Sitruk, A. and Plattard, S. (2017) *the Governance of Galileo*. European Space Policy Institute.

Skocpol, T. (1979) *States and social revolutions: A comparative analysis of France, Russia and China*. Cambridge, UK: Cambridge University Press.

Steer, C. and Hersch, M. eds. (2020) *War and Peace in Outer Space: Law, Policy, and Ethics*. Oxford University Press.

Steinmo, S., Thelen, K. and Longstreth, F. (Eds.) (1992) *Structuring politics: Historical institutionalism in comparative analysis*. Cambridge studies in comparative politics. Cambridge, UK: Cambridge University Press.

Streeck, W. and Thelen, K. (Eds.) (2005) *Beyond continuity: Institutional change in advanced political economies*. New York: Oxford University Press.

Sydow, J., Schreyögg, G. and Koch, J. (2020) On the theory of organizational path dependence: Clarifications, replies to objections, and extensions. *Academy of Management Review*, 45(4), pp.717-734.

Suzuki, K. (2003) *Policy Logics and Institutions of European Space Collaboration*, London: Routledge.

Thelen, K. (1999) Historical institutionalism in comparative politics. *Annual Review of Political Science*, 2 (2), pp. 369–404.

Thelen, K. (2004) *How institutions evolve. The political economy of skills in Germany, Britain, the United States and Japan*. Cambridge, UK: Cambridge University Press.

Thoenig, J.-C. (2011) Institutional Theories and Public Institutions.: New Agendas and Appropriateness, In: Peters B.G. and J. Pierre. *The Handbook of Public Administration*, pp.185-201., Thousand Oaks, CA: Sage.

Tilly, C. and Ardant, G. (1975) *The formation of national states in western Europe*. Princeton: Princeton University Press.

Tossini, V. (2020) The Five Eyes - The Intelligence Alliance of the Anglosphere, Available at: <https://ukdefencejournal.org.uk/the-five-eyes-the-intelligence-alliance-of-the-anglosphere/>, [Accessed on 05/06/2021].

UK Government (2017) UK Air and Space Power, Ministry of Defence Joint Doctrine Publication, Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/668710/doctrine\\_uk\\_air\\_space\\_power\\_jdp\\_0\\_30.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/668710/doctrine_uk_air_space_power_jdp_0_30.pdf), [Accessed on 05/06/2021].

UK Government (2018) Modernising Defence Programme - Update. Available at: <https://www.gov.uk/government/speeches/modernising-defence-programme-update>, [Accessed on 05/06/2021].

Vaismoradi, M., Jones, J., Turunen, H. and Snelgrove, S. (2016) Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, 6(5), pp. 100-110.

Vaismoradi, M., Turunen, H., and Bondas, T. (2013) Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study, *Nursing and Health Sciences*, 15(3), pp. 398-405.

van Benthem, J. (2002) Extensive games as process models, *Journal of Logic, Language and Information*, 11 (3), pp. 289-313.

von der Dunk, Frans G. (2010) "Europe and Security Issues in Space: The Institutional Setting" *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 58.

Vinsel, L. and Russell, A.L., 2020. *The innovation delusion: How our obsession with the new has disrupted the work that matters most*. Currency.

Wang, S.C. (2009) The making of new 'space': Cases of transatlantic astropolitics. *Geopolitics*, 14(3), pp.433-461.

Weber, M. (1978) *Economy and society: An outline of interpretive sociology* (G. Roth and C. Wittich, Trans.). Berkeley: University of California Press.

Weiner, M. J. (2004) *English Culture and the Decline of the Industrial Spirit, 1850-1980*, Cambridge: Cambridge University Press.



Weichert, B.J. (2017) The high ground: the case for US space dominance. *Orbis*, 61(2), pp.227-237.

Wolgemuth, J. R. and V. Agosto (2019) Narrative Research, In: G. Ritzer and C. Rojek, *The Blackwell Encyclopaedia of Sociology*, Hoboken, NJ: John Wiley and Sons.

Young, J. W. (2000) *Britain and European Unity 1945-1999*, 2<sup>nd</sup> ed., Basingstoke: Red Globe Press.

Zabusky, S. E. (1995) *Launching Europe: An Ethnography of European Cooperation in Space Science*, Princeton: Princeton University Press.

Zenko, M. (2014) *Dangerous space incidents*. Council on Foreign Relations. Accessed July 3, 2021, <http://www.jstor.org/stable/resrep05653>.

Zey, M. (1998) *Rational choice theory and organizational theory: A critique*. Sage.