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The effect of nuclear weapons in compellent threats

A research on the influence of possession of nuclear weapons on the success of a compellence case

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Introduction

In 1945, the United States of America (USA) developed the first nuclear weapons. That same year, they dropped two of them on the Japanese cities Hiroshima and Nagasaki. Since then, nuclear weapons have not been used again in a war situation. However, these weapons do play an important role in international politics. Singh (2004, p. 859) argues that proliferation of nuclear weapons became even more important since the end of the Cold War. With the end of the Cold War ended the security the superpowers guaranteed within the international system. As a result, smaller states also wanted to acquire nuclear weapons to guarantee their own safety (Singh, 2004, p. 859).

Because of their devastating impact, research has focused on the role nuclear weapons play in foreign policy and the coercion possibilities these weapons give states. Most research (Betts, 1987; Trachtenberg, 1991; Snyder and Diesing, 1977; Halperin, 1987) used a comparative design by applying an in-depth case study. Betts (1987), Trachtenberg (1991) and Snyder and Diesing (1977) all concluded that nuclear power can be a bargaining asset in crises. Halperin (1987) did similar research using an in-depth research design and concluded the opposite: nuclear weapons do not play a central role in the outcome of crises (quoted in Sechser and Fuhrmann, 2013, p. 178). Therefore, as Rauchhaus (2009, p. 271) points out, in-depth case studies – even when using the same cases – have contradicting conclusions.

Within coercive threats it is relevant to distinguish between threats posed to deter and threats posed to compel. Schelling (1966, pp. 71-72) clearly explains the difference. He argues that a deterrent threat tries to prevent an action from happening and a compellent threat wants some action to be taken. More contemporary research on this topic still uses these definitions of Schelling, only sometimes coercion is used as synonym to compellence (Sechser and Fuhrmann, 2017, p. 22).

Most former research on coercive threats has focused on nuclear deterrence. The idea of deterrence or nuclear deterrence was first formulated by Bernard Brodie in 1946 (Sigal, 2015, pp. 247-249). The main purpose was to prevent wars by using a deterrence strategy. The idea was to prevent a nuclear war by threatening with nuclear retaliation (Sigal, 2015, pp. 247-249). The main differences between deterrence and compellence revolve around the timing and the initiative. Within deterrent threats the timing is not important, and the threat is posed by the defender state (Schelling, 1966, pp. 70-72). On the other hand, within compellent threats, the timing is important, and the threat is posed by the initiator state.

Since a lot of former research already focused on nuclear deterrence, this thesis focusses on nuclear compellence. The more aggressive nature of compellent threats compared to deterrent threats is another reason for this thesis to focus on compellent threats. Due to compellent threats being made to initiate an action, they are believed to be more aggressive. After comparing deterrence and compellence cases, Peterson (1986, p. 279) concludes that compellence cases are more likely to result in war. Nonetheless, he notes that – all things remaining equal – initiators still consider the expected costs of war before compelling.

Research has also focused on the coercion possibilities of nuclear weapons within compellent threats. According to Volpe (2017, p. 517) nuclear weapons can be of great importance in international politics because of their destructive capability. In the past, states have already played the nuclear card in compellent threats. Nuclear weapons have been used as bargaining chip to buy time or to alleviate pressure (p. 518).

According to Sechser and Fuhrmann (2013, p. 173), scholars and policymakers have long believed that nuclear weapons can persuade states to not undertake a certain action that might call for retaliation. It is possible that nuclear weapons do indeed have this coercive utility (Sechser and Fuhrmann, 2017, p. 4). If this is true, nuclear powers can obtain their goals more easily. In other words, without actually having to fight for it (p. 5). Because nuclear weapons can be of great importance in compellent threats, this thesis focusses on coercion possibilities of nuclear weapons within compellent threats. For this reason, the central question of this thesis is: *do compellence cases in which states possess nuclear weapons succeed more often than compellence cases in which states do not possess nuclear weapons?*

Sechser and Fuhrmann (2013) already did research on coercion possibilities of nuclear weapons in compellent threats. Their research focusses on the state who initiates the action (the initiator). In other words, they examined if a state which poses a threat against another state (the defender) will be more likely to get what it wants if it possesses nuclear weapons. According to their conclusion, the success of compellent threats is not affected by possession of nuclear weapons by the initiator state.

Overall, former research did not focus on possession of nuclear weapons by the defender state, or research did not distinguish between possession of nuclear weapons by the initiator or the defender state. However, in this thesis it is argued that it is crucial to make a distinction between possession of nuclear weapons by an initiator or a defender state within compellent threats. Reasons for this are two-fold. First, previous research did argue that states which are threatened, are more willing to use their nuclear weapons (Waltz, 1990). Second,

Sechser and Fuhrmann (2013, p. 174) argued that the total costs of war of using nuclear weapons are lower for the defender than for the initiator state.

These reasons for making a distinction between possession of nuclear weapons by an initiator or a defender state can have consequences for the success of compellent threats. Like the initiator state, a nuclear defender state makes a risk calculation and possibly concludes that his own risks are lower than the risks of the initiator state. Subsequently, a nuclear defender state may not be compelled by a nuclear initiator. As a result, this defender will not choose to comply and the compellence case has failed.

Thus, a distinction can be made between possession of nuclear weapons by the defender state and the initiator state and the chance on successful compellence. To give a complete and thorough answer to the research question, this thesis will clearly distinguish between possession of nuclear weapons by the initiator state, defender state or by both these states.

The central question is answered by using a quantitative method. The reasons for using a quantitative method are two-fold. First, because former, in-depth cases studies sometimes had contradicting conclusions, a quantitative method seemed most suitable to answer the research question. Second, the question of this thesis is about compellent threats in general. Therefore, a large N-study is appropriate, because such a research design allows conclusions to be generalized.

To apply quantitative research on this topic, the Militarized Compellent Threats (MCT) data set is used. This data set contains compellence cases from 1918 until 2001, 242 cases in total (Sechser, 2011). These compellence cases are filtered because only militarized compellent threats are added in the data set. However, since this is the only available data set of compellent threats, it is not possible to include all compellence cases in this research. Given this restriction, the data set of Sechser is used to answer the research question.

The MCT data set is used to perform a Kruskal-Wallis test. With this test is examined if a difference exists in successes between four different groups. These four groups are nonnuclear states vs. nuclear states, nuclear states vs. nuclear states, nuclear states vs. nonnuclear states and nonnuclear states vs. nonnuclear states. Since the Kruskal-Wallis test only examines if a difference between any of the four groups exists, an appropriate post hoc test is performed. With this follow-up test it is possible to evaluate the difference between the four groups.

Before actually performing these tests, compellence is extensively explained. Subsequently is discussed when and why compellence is successful. Thereafter, information

is given about the role nuclear weapons play in compellent threats and the importance of a strike-back capability is explained.

Theoretical Scope

Before answering the research question, the concept of compellence has to be clarified. Therefore, compellence is first explained and discussed. Also, more is elaborated on the difference between (nuclear) deterrence and compellence. After this difference is clear, the focus shifts to how nuclear weapons are used in compellence cases. In particular, a distinction is made on possession of nuclear weapons by the defender or by the initiator state. Furthermore, why risk calculation and the possibility of a strike-back capability are crucial in nuclear compellence cases, is described.

Coercive diplomacy

A nation can employ several tools to restrain or resolve international conflicts. Coercive diplomacy is one of these tools (Lewis, 1992, pp. ix-x). George describes it as a political-diplomatic strategy (Levy, 2008, p. 539). The purpose of this strategy is influencing an opponent's will or incentive structure in order to force the opponent to comply with the demands of the initiator. It can be seen as a bargaining strategy which combines threats of force – if necessary – with the limited and selective use of force.

The study of coercive threats in international relations has been going on for decades. The location of these threats is the world stage and the actors are states, large and small ones. Therefore, within the IR-theory, mostly the realist and sometimes the neoliberalist theory are associated with this topic (Rauchhaus, 2009, p. 259).

A traditional explanation of coercive threats is given by Thomas Schelling in his book *Arms and Influence* (1966). Schelling distinguishes between deterrent and compellent coercive threats. A deterrent threat is meant to prevent a certain action from happening out of fear for the consequences of this action (Schelling, 1966, p. 71). A compellent threat on the other hand, wants a certain action to be taken; it initiates an action (p. 72). For this reason, compellence is believed to be more aggressive than deterrence. More contemporary research on this topic still uses these definitions of Schelling, with one change. Schelling used the term coercion to refer to both deterrence and compellence, but more contemporary research uses coercion as synonym to compellence (Sechser and Fuhrmann, 2017, p. 22).

As mentioned before, a deterrent threat is meant to prevent a certain action from happening (Schelling, 1966, p. 71). In other words, a deterrent threat is meant to prevent an

attack from happening. The two main differences between deterrence and compellence revolve around the initiative and the timing (p. 69). The difference of the initiative is grounded in who poses the threat. In contrast to compellence cases, the threat in a deterrence case is posed by the defender state (p. 70). In compellence cases, the threat is posed by the initiator state. Within a deterrence case, the defender poses a threat to prevent an initiator from acting. If the threat is credible and the initiator is indeed deterred, the status quo is maintained.

The other main difference concerns the timing. Within a compellent threat, timing is important; it has to be definite (Schelling, p. 72). If an initiator poses a threat, there has to be a deadline. The defender must have acted before this deadline. A deterrent threat on the other hand, tends to be indefinite (p. 72). If a line is crossed, then the threat will be fulfilled. When this is happening, does not matter.

Compellence

Now that the difference between deterrence and compellence is explained, the focus will be on compellence. As discussed, compellence is a means to demand for a chance, but this demand can take several forms. A state can demand another state to remove military forces or nuclear weapons, but it can also ask for policy changes (Sechser and Fuhrmann, 2017, pp. 24-25). The whole process of compellence is interactive and contains at least two actors (p. 28). One actor demands the other actor to undertake a certain action or actions. The state who demands is called the initiator. The state of which something is demanded, is called the defender. It is an interactive process because it contains two steps, influenced by the circumstances but also by the expectations of the initiator and defender state (p. 28). After the compellent threat is sent by the initiator, the defender can choose to comply with the demand or to resist. Subsequently, the initiator can choose to back down or to carry out its threat. This whole process is visualised by Sechser and Fuhrman in Figure 2.1 (2017, p. 28).

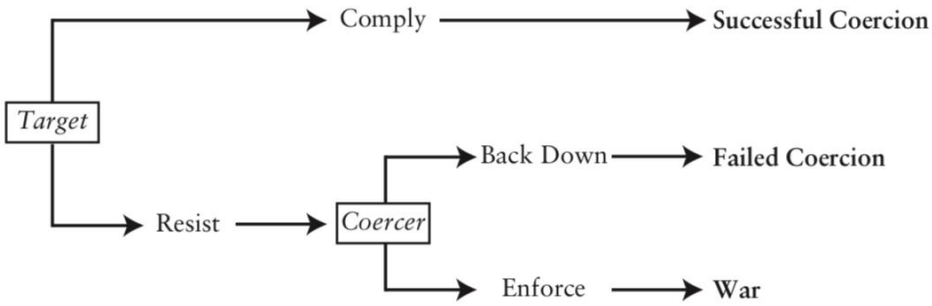

Figure 2.1 A simple framework of coercion.

Considering that this thesis focusses on possession of nuclear weapons and its influence on the success of compellent threats, more will be elaborated on when compellence can be called successful. According to Sechser and Fuhrmann (2017, p. 27), compellence is successful if the status quo is changed. This change can be a change of policy, a removal or relinquish of a (military) possession or anything the initiator demanded. In a successful compellence situation the defender chooses to comply (p. 28). If a defender will choose to comply depends on the defender's beliefs on the credibility of the initiator's threat. If the defender believes that the initiator is willing to perform its threat, compellence is more likely to succeed.

Because in this thesis the Militarized Compellent Threats (MCT) data set, created by Sechser, is used, it is necessary to describe how Sechser defines compellence and which cases he included in his data set and which ones he did not. In his data set, Sechser concentrates on militarized compellent threats. Sechser (2011, p. 380) defines a militarized compellent threat as: '*an explicit demand by one state (the challenger) that another state (the target) alter the status quo in some material way, backed by a threat of military force if the target does not comply.'*

Subsequently, Sechser defines three main characteristics of these militarized compellent threats. He argues that the threat has to demand for a material change in the status quo (p. 380). He elucidates that the policy against which the threat is made, must already be implemented. The second feature concentrates on what happens after the demand is not met. Sechser indicates that the threat must involve an assurance of future military action (p. 380). And with his last feature, Sechser argues that the threat has to be made by one state against another state. In other words, it cannot be between non-state actors. Since this thesis focusses

on the effect of possession of nuclear weapons in compellent threats, more is subsequently explained about the role of nuclear weapons in compellence.

Nuclear weapons

In 1945, nuclear attacks were made on two Japanese cities: Nagasaki and Hiroshima. Ever since that moment, nuclear weapons have a bad name (Waltz, 1990, p. 731). Despite their bad name, Waltz (1990, p. 743) states that nuclear weapons – in comparison to conventional weapons – make it less likely that countries go to war with each other. He argues that possession of nuclear weapons is a tremendous force for peace. The possibility of war remains, but never since the Peace of Westphalia in 1648, a longer period of peace between great powers have existed since after World War II (p. 744). This period is called the Long Peace. It seems, wars are extremely hard to start between states who possess nuclear weapons. Rauchhaus (2009, p. 269) supports this as he concluded that the probability of war decreases when both states possess nuclear weapons.

Since 1945, research on nuclear weapons did not only focus on wars, it did also focus on the coercive utility these weapons give states (Sechser and Fuhrmann, 2013, p. 175). A debate is still going on whether states who possess nuclear weapons make other states compel to concessions they would otherwise not make (p. 175). If nuclear weapons do give states this coercive utility, nuclear powers can easier get what they want without actually have to fight for it (Sechser and Fuhrmann, 2017, p. 5). In this debate, Betts (1987) and Trachtenberg (1991) did in-depth research on different Cold War cases. On the basis of these cases they concluded that nuclear superiority was tagged along to compellence success (Sechser and Fuhrmann, 2013, p. 175). Snyder and Diesing (1977, pp. 460-462) also contributed to this debate. They looked at cases between the USA and the Soviet Union during the Cold War. They stated that quantitative superiority of nuclear power can be a benefit of bargaining in crises, but the value of this benefit is unclear. Sechser and Fuhrmann (2013) mentioned this ongoing debate and used a quantitative method to conclude the opposite: nuclear possession does not contribute to compellence success.

After showing that the influence of nuclear weapons in coercive diplomacy is debated, more is explained about nuclear threats used in compellence. According to Sechser and Fuhrmann (2017, p. 3), nine countries have built nuclear weapons since the first nuclear device was made and tested in 1945 by the United States. These countries are – in sequence of

becoming a nuclear power – the United States, the Soviet Union, Great Britain, France, China, Israel, India, South Afrika, Pakistan and North Korea (p. 4). South Africa, however, destroyed its arsenal in the 1990's. By doing that, South Africa is the first country to build and also dismantle a nuclear arsenal (Goodson, 2012, p. 209). According to Goodson (2012), South Africa possessed nuclear weapons until the beginning of the 90's.

If looked at possession of nuclear weapons used in compellence, Sechser and Fuhrmann note two limitations (2013, p. 174). First, nuclear weapons cannot be used to seize territory or other objects if the defender refuses to comply (p. 177). This, because a nuclear attack from the initiator can destroy the territory or object the initiator wants to gain. A second limitation of nuclear weapons used in compellence, is the enormous costs of war accompanied by using nuclear weapons as punishment (p. 174). Using nuclear weapons would mean annihilation of one or – in case the defender strikes back – both countries. Therefore, nuclear weapons will not make compellent threats more effective. However, this last argument is made by Sechser and Fuhrmann while only looking at possession of nuclear weapons by the initiator state. They themselves even acknowledge that if a state's own survival is at risk, nuclear threats may be credible (p. 178). They also note that the costs of using nuclear weapons for self-defence are not as high as when they are used to demand another state to undertake some action (p. 174).

It is also important to note that the use of nuclear weapons rarely has been explicitly used to threaten (Sechser and Fuhrmann, 2013, p. 176). Nonetheless, Beardsley and Asal (2009) argue that even if nuclear weapons are not used, possession of these weapons helps states to succeed in their confrontations with other states (quoted in Sechser and Fuhrmann, 2013, p. 176). Kissinger (1956) also mentions that observable threats have become unnecessary because nuclear weapons have to be included into every calculation of risks (quoted in Sechser and Fuhrmann, 2013, p. 176).

Sechser and Fuhrmann (2013) already performed quantitative research on nuclear weapons in coercive diplomacy. They questioned if countries with nuclear weapons had coercive advantages. Sechser and Fuhrmann focused on the influence of possession of nuclear weapons by the initiator state. Within coercive diplomacy, they concentrated on compellent threats (p. 173). They used the MCT data set to test their two hypotheses with quantitative analysis. The first hypothesis is that compellent threats from nuclear states are more likely to succeed. Within this hypothesis they distinguished between compellent threats from nuclear states to nuclear states and threats from nuclear states to nonnuclear states. Their second hypothesis states that compellent threats from nuclear states are not more effective than

compellent threats from nonnuclear states (2013). It is noteworthy that Sechser and Fuhrmann also included cases from nonnuclear powers in order to make a correct comparison between those countries who do and those who do not possess nuclear weapons (p. 174). Using 'compellence success' as dependent variable, they used 'nuclear challenger', 'nuclear target' and an interaction between those two as independent variables (p. 182). They proved the first hypotheses incorrect and the second one correct (p. 191). According to Sechser and Fuhrmann, compellent threats from nuclear states are not more likely to succeed. Moreover, compellent threats from nuclear states are not more effective than compellent threats from nonnuclear powers.

Risk calculation and strike-back capability

After explaining the role of nuclear weapons in coercive diplomacy, it is relevant to focus on the importance of a strike-back capability. Before a state decides to compel or deter another state, a risk calculation is done. According to George and Smoke (1974), the belief that the risks of certain actions are calculable is a necessary condition for an initiator to choose for coercive diplomacy (quoted in Levy, 2009, p. 548). They state that an initiator must have the belief the risk can be controlled or avoided if it chooses to compel or deter. The same is true for the defender state. The defender must have the belief the risk can be controlled or avoided if it does not choose to comply, otherwise it will choose to comply.

By calculating these risks in deterrence and compellence cases, the possibility of a strike-back from the defender state is important. The Oxford Essential Dictionary of the U.S. Military (2002) describes a strike-back capability or second-strike capability as '*the ability to survive a first strike with sufficient resources to deliver an effective counterblow*'. In Figure 2.1 (Sechser and Fuhrmann, 2017, p. 28) this strike-back capability is visible as the possibility to strike back after the initiator has chosen for the option to enforce. The initiator has the possibility to choose this option to enforce after the defender has not chosen to comply and compellence is labelled as not successful.

When adding the variable that a defender state possesses nuclear weapons, it changes the entire risk calculation. As mentioned, before starting a compellent threat, an initiator state will calculate its risks (Levy, 2009, p. 548). While calculating its risks, an initiator will take into account that success of a first strike can never be guaranteed if the defender state possesses nuclear weapons (Waltz, 1990, p. 734). This, because a strike-back from a defender

state in such a compellence case, would mean annihilation of both countries (Sechser and Fuhrmann, 2017, p. 6).

Also, the initiator's perception of the defender's strength becomes less important if the defender possesses nuclear weapons. Volpe (2017, p. 520) argues that with only a few nuclear weapons, the playing field of a compellence case has been levelled. Because, despite the possibility that an initiator has nuclear superiority, one is reluctant to use this superiority because the success of a first strike can never be guaranteed (Waltz, 1990, p. 734). A state can never know if with that one strike the whole nuclear arsenal of the defender is destroyed. If the initiator does not even possess nuclear weapons, destroying the whole nuclear arsenal of the defender is almost impossible.

If theory about the strike-back capability of the defender state and theory about nuclear weapons in compellence are combined, the following is noteworthy. It is crucial to distinguish between possession of nuclear weapons by the initiator state, the defender state or by both states. One could argue that an initiator with or without nuclear weapons could better not use a compellent threat against a defender state who possesses nuclear weapons. The reason for this is that nuclear weapons are often used in coercion but never with the intention of ever using them, only to let the defender state believe this. It is more difficult to only use nuclear weapons as coercion and never really wanting to use them if the defender state also has the possibility to use nuclear weapons. That is to say, Waltz (1990) argues that states are more willing to use nuclear weapons if they feel threatened. Whilst this can be argued, case examples show that states still compel or deter states which possess nuclear weapons. A well-known example is the Cuba crisis where the nuclear USA chose to compel the also nuclear Soviet Union (Trachtenberg, 1985).

As described before, states that are threatened are more willing to use nuclear weapons. Moreover, the costs of using nuclear weapons are lower for the defender than for the initiator state. This is founded in the theory that the costs of using nuclear weapons for self-defence are not as high as when they are used to demand another state to undertake some action (to compel) (Sechser and Fuhrmann, 2013, p. 174). Rauchhaus (2009, p. 270) contributed to this by stating that '*the probability of crisis initiation and limited uses of force between two states is found to increase when both states possess nuclear weapons.'* He also argues that if only one state possesses nuclear weapons, a greater chance of militarized disputes and wars exists as well (p. 270).

Making a distinction between possession of nuclear weapons by an initiator or a defender state can have consequences for the success of compellent threats. Like the initiator

state, a nuclear defender state makes a risk calculation and possibly concludes that his own risks are lower than the risks of the initiator state. Subsequently, a nuclear defender state may not be compelled by a nuclear initiator. As a result, this defender will not choose to comply and the compellence case has failed.

Based on this theory, the research question is tested. To repeat, the research question is: *do compellence cases in which states possess nuclear weapons succeed more often than compellence cases in which states do not possess nuclear weapons?*

Methodology

As mentioned before, this thesis focusses on possession of nuclear weapons in coercive diplomacy. A lot of research on this same topic has been done using an in-depth case design. This was done by Betts (1987), Trachtenberg (1991) and Snyder and Diesing (1977). They all concluded that nuclear power can be a bargaining asset in crises. Halperin (1987) did similar research and concluded the opposite: nuclear weapons do not play a central role in the outcome of crises (as cited in Sechser and Fuhrmann, 2013, p. 178). As contradicting conclusions can be drawn from in-depth case studies, the method used in this thesis is quantitative. As explained before, another reason to conduct quantitative research is because this thesis is about compellent threats in general. Therefore, a large N-study is appropriate because such a research design allows conclusions to be generalized.

Quantitative research is applied by using the Militarized Compellent Threats (MCT) data set of Sechser (2011) to answer the question: *do compellence cases in which states possess nuclear weapons succeed more often compared to compellence cases in which states do not possess nuclear weapons?* The MCT data set is created by Sechser (2011) for the purpose of testing hypotheses about the use and effectiveness of compellent threats in international politics. The data set contains militarized compellent threat cases from 1918 until 2001. No other data set of compellent threats exists. Given that restriction, this data set is used.

The cases of the MCT data set are filtered by three features: the threat has to demand for a material change in the status quo, the threat must involve an assurance of future military action and the threat has to be made by one state against another state (Sechser, 2011, p. 380). Of each case is mentioned who the initiator and who the defender is and in what year the case took place. To answer the research question, all 242 cases in the data set are used. Research on this topic by using the MCT data set, has already been done (Sechser and Fuhrmann, 2013). Only, as mentioned before, this research – in comparison to former research – clearly distinguishes between possession of nuclear weapons by the initiator state, the defender state or by both.

To answer the research question, the already existent variable ‘compellence success’ is used as dependent variable. This variable is based on compliance of the defender state. As discussed earlier, a compellence case can be called successful if the defender state chooses to comply. In the MCT data set, the variable compliance has been coded as 0 if no demands

were met, 1 if some but not all demands were met and as 2 if all demands were met (Sechser, 2011). A defender also chooses to comply if some demands are met. Therefore, in this thesis a case has been coded as 1 when some or all demands were met (1 or 2 of the variable compliance) and as 0 if no demands of the initiator were met (0 of the variable compliance).

Comparing group means

The research question is answered by performing quantitative analysis in two steps. With the first step, group means are compared by performing a one-way between-groups ANOVA. Comparing group means is exactly what is needed to answer the research question. The relevant groups of cases are a nonnuclear initiator vs. a nuclear defender, a nuclear initiator vs a nuclear defender, a nuclear initiator vs. a nonnuclear defender and a nonnuclear initiator vs. a nonnuclear defender. With comparing the amount of successes of the four groups, it is possible to answer the central question.

When a state started possessing nuclear weapons is based on Table 1.1 in Sechser and Fuhrmann (2017, p. 4). In this table is listed which states have acquired nuclear weapons and when they acquired them. These countries are:

- United States of America (1945)
- Russia (1949)
- Great Britain (1952)
- France (1960)
- China (1964)
- Israel (1967)
- India (1974)
- South Africa (1979)
- Pakistan (1987)
- North Korea (2006)

Since South Africa dismantled its nuclear arsenal in the beginning of the 1990's, South Africa is only seen as nuclear power from 1979 until the beginning of the 1990's. Further, North Korea started possessing nuclear weapons in 2006. Yet, the cases which are used, are until 2001. Therefore, North Korea is not recognized as nuclear power in this thesis.

Based on this information, a nominal variable is inserted in the data set. This variable contains information about possession of nuclear weapons by the initiator, the defender, by

both or by none. A case is defined as 1 in the event of a nonnuclear power compelling a nuclear power. Further, a case is defined as 2 if a nuclear power compels another nuclear power and as 3 if a nuclear power compels a nonnuclear power. Finally, a case is defined as 4 in the event of a nonnuclear power compelling another nonnuclear power. An overview of these groups can be found in Table 1. Which cases are placed in which groups can be found in Table 3, Table 4 and Table 5 in Appendix I. The Correlates of War country code (Sarkees and Wayman, 2010) is used to link the country to the case.

Table 1

Cases divided into four groups

	Initiator	**Defender**	**Number of cases**
1	Nonnuclear	Nuclear	5
2	Nuclear	Nuclear	7
3	Nuclear	Nonnuclear	44
4	Nonnuclear	Nonnuclear	186

With this new variable, a one-way ANOVA is performed with ‘compellence success’ as dependent variable. With this test it is possible to describe if a difference exists between the means of the difference groups. However, if a difference exists, it is not possible to evaluate the nature of the differences between the groups with just this test. Therefore, a follow up test is done based on the results of the one-way ANOVA.

By performing a follow up test, it is possible to specifically describe differences between the groups. For example, if the third group of cases is compared to the other groups, it is possible describe if cases in which only the initiator possesses nuclear weapons succeed or fail more often than other cases.

Results

As described above, the research question is answered by comparing the means of the four different groups. After performing the one-way between-groups ANOVA test, the appropriate follow-up test is chosen to evaluate the differences between the groups. However, before comparing means via this statistical test, it is useful to describe the overall chance of a compellence case being successful. If looked at the 242 in the data set, almost half of these cases are coded successful (M = 0,45; SD = 0,5). This is described, using the variable 'compellence success'.

Descriptive statistics of the four groups

After describing the overall chance of a compellence being successful for all cases, it is relevant to describe the overall chance of a compellence being successful for every one of the four different groups. The descriptive statistics associated with the success across the four groups of states are reported in Table 2. It can be seen that the first group of cases containing a nonnuclear initiator and a nuclear defender (N = 5) was associated with the numerically highest chance of success (M = 0,80). The second group of cases containing only nuclear states (N = 7) was associated with a numerically lower chance of success (M = 0,71). The third group of cases containing a nuclear initiator and a nonnuclear defender (N = 44) was associated with the numerically lowest chance of success (M = 0,23). Lastly, the fourth group of cases containing only nonnuclear states (N = 186) was associated with a numerically higher chance of success compared to the third group, but a lower chance of success compared to the first two groups (M = 0,48). The means of the four groups are visualised in Figure 1.

Table 2

Descriptive statistics of the four groups using compellence success as dependent variable

Group	N	Mean	Std. Deviation	Std. Error
1	5	,80	,447	,200
2	7	,71	,488	,184
3	44	,23	,424	,064
4	186	,48	,501	,037
Total	242	,45	,499	,032

Note. This research used the variable 'compellence success'. This variable is based on compliance. This is extensively explained in the methodology. Yet, in the MCT data set exists another variable 'force'. If these two variables are compared, it is surprising that it is possible for a case in which force is used to also be successful. One could argue that if force is used, a compellence case can no longer be called successful. A compellence case revolves around the notion that an initiator state threatens to use force, but never with the intention of ever using it, only to let the defender state believe this.

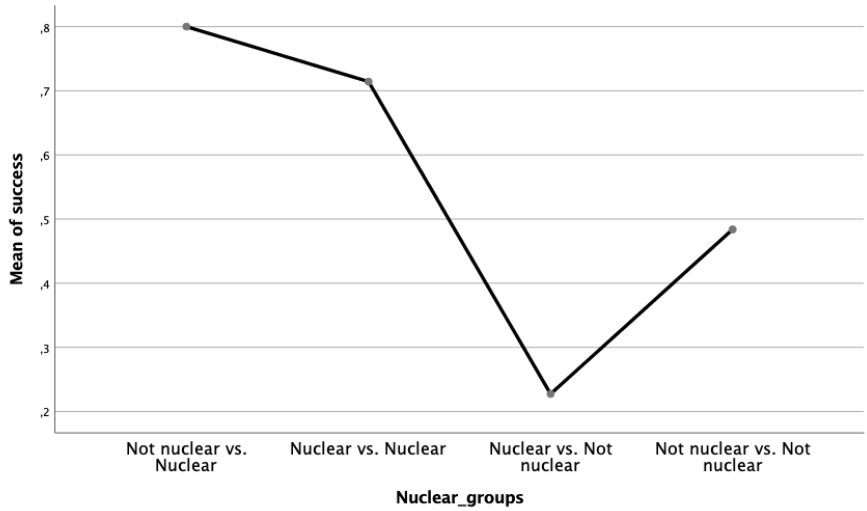

Figure 1. Means of the four different groups

The difference in amount of successes between the four different groups is tested. In order to test this, a one-way between-groups ANOVA was performed. Prior to conducting the ANOVA, the assumption of homogeneity of variances was tested and not satisfied based on Levene's *F* test, $F(3, 238) = 25{,}131$, $p = 0{,}000$. This means the variances are not homogenous.

When group sizes are equal the *F*-statistic of ANOVA can be robust after violating the assumption of homogeneity of variances (Field, 2013, p. 444). However, as can be seen in Table 1, the group sizes of the groups used in this research are not equal. Therefore, ANOVA cannot be used. Instead of performing the ANOVA, a non-parametric variant is used: the Kruskal-Wallis Test.

Kruskal-Wallis Test

As mentioned earlier, the homogeneity of variances was violated. This can be solved by performing a Kruskal-Wallis Test (Field, 2013, p. 236). Similar to the one-way between-groups ANOVA, the Kruskal-Wallis Test compares the means of more than two groups. After performing this test, the following can be reported. The Kruskal-Wallis Test yielded a statistically significant effect, H (3) = 14,071, p = 0,003. Thus, the null hypothesis of no difference between the means was rejected. However, based on this result, it is not possible to examine the exact differences between the four groups. It is only possible to say that a difference exists somewhere, but not between which specific groups.

As a result, to evaluate the nature of the differences between the four means further, a follow-up analysis was performed. An overview of the results of this post hoc Kruskal-Wallis Test can be found in Figure 4 in Appendix II. As can be seen in this figure, most results were not statistically significant. However, the results can be used. The reason the results can be used, is that this thesis did not examine a sample, but the whole population. If a research examines the whole population, significance is of less importance. Moreover, the specific reason for the results not being significant in this research, is because of the amount of cases within the groups.

Pairwise comparisons of the post hoc Kruskal-Wallis Test with adjusted *p*-values showed the following:

- Group 1 (Nonnuclear states vs. Nuclear states) was associated with more successes than group 2 (Nuclear states vs. Nuclear states). However, this difference was not statistically significant H (3) = 10,371, p = 1,000.
- Group 1 (Nonnuclear states vs. Nuclear states) was associated with more successes than group 3 (Nuclear states vs. Nonnuclear states). However, this difference was also not statistically significant H (3) = 69,300, p = 0,090.

- Group 1 (Nonnuclear states vs. Nuclear states) was associated with more successes than group 4 (Nonnuclear states vs. Nonnuclear states). However, this difference was again not statistically significant H (3) = 38,252, p = 0,971.
- Group 2 (Nuclear states vs. Nuclear states) was associated with more successes than group 3 (Nuclear states vs. Nonnuclear states). However, this difference was again not statistically significant H (3) = 58,929, p = 0,098.
- Group 2 (Nuclear states vs. Nuclear states) was associated with more successes than group 4 (Nonnuclear states vs. Nonnuclear states). This difference was also not statistically significant H (3) = 27,880, p = 1,000.
- Group 3 (Nuclear states vs. Nonnuclear states) was associated with less successes than group 4 (Nonnuclear states vs. Nonnuclear states). This difference was statistically significant H (3) = -31,048, p = 0,013.

Conclusion and Reflection

Before examining the results from the statistical tests, it is relevant to look at the differences already visible in Table 1. As described before, in this table the cases are ordered based on the possession of nuclear weapons by the initiator, the defender or both states. Some conclusions can already be drawn from this table. The most noticeable difference between the tables is the amount of cases. Many more cases exist in which only the initiator possesses nuclear weapons compared to the cases in which both states possess nuclear weapons (44 vs. 7).

Based on this difference, it is concluded that an initiator state which possesses nuclear weapons, more often compels a nonnuclear state than a nuclear state. That said, it can be explained by the risk calculation which an initiator does before choosing to apply coercive diplomacy. According to George and Smoke (1974), an initiator must have an amount of certainty the risk can be controlled or avoided if it chooses to compel or deter (quoted in Levy, 2009, p. 548). Because of the disastrous capacity of nuclear weapons, compelling a nuclear power is riskier and more difficult to control than compelling a nonnuclear power. Therefore, an initiator must be sure the risk can be avoided if it chooses to compel. Thus, however this difference may not be surprising, it is worth mentioning.

Perhaps even more remarkable, in 5 cases, the initiator state did not possess nuclear weapons and the defender did. Compared to the cases with a nuclear initiator, these cases are even riskier. As a result, it is concluded that possessing nuclear weapons is no guarantee for a state that it will never be compelled. In 12 cases a nuclear defender was compelled. However, based on the data used, it is not possible to conclude that possessing nuclear weapons reduces the risk of being compelled. Less cases exist in which a nuclear defender is compelled. Nonetheless, also more nonnuclear states than nuclear states are present in the international system. Since this is an interesting topic for a state's foreign policy, future research could focus on the relation between possessing nuclear weapons and the risk of being compelled.

After reviewing these tables, the results from the statistical tests are examined. Based on these statistical tests, the research question is answered. As already explained before, it is important to make a distinction between possession of nuclear weapons by the initiator state, the defender state or by both states. As can be seen in Figure 1, the amount of successful cases differs between the four different groups. To thoroughly answer the research question, in the next section elaborates on these differences.

Only a nuclear initiator

Despite that research has already focused on compellence cases with only a nuclear initiator, to completely answer the research question it is also mentioned in this research. All cases in which only the initiator possesses nuclear weapons are compiled in group 3. If this group is then compared to the other groups, it can be said that cases in which only the initiator possesses nuclear weapons are associated with the least successes compared to the other three groups.

Although not statistically significant, the difference in amount of successes between group 3 and group 1 is the biggest. Hereby, the cases of group 3 are associated with less successes. It is relevant to mention that the difference in successes between group 3 and group 4 is significant. Again, cases with a nuclear initiator are related to less successes.

Thus, compellence cases in which only the initiator possesses nuclear weapons fail more often than compellence cases in which the initiator does not possess nuclear weapons. This is surprising, since Sechser and Fuhrmann (2013) also tested this with the MCT data set. Be that as it may, this former research differed in using another variable and another method to measure the success of cases.

Based on this finding, it is concluded that states which possess nuclear weapons do not obtain their goals more easily (without actually having to fight for it) if they compel another state. Possessing nuclear weapons does not give a state the coercive possibilities that is long believed they did. A possible explanation for this finding is given by Rauchhaus (2009, p. 270). He argues that if only one state possesses nuclear weapons, a greater chance of militarized disputes and wars exists. However, Rauchhaus did not mention which state, the initiator or the defender state. Therefore, further research could try to find a better, more complete explanation for this finding.

A nuclear initiator and a nuclear defender

Moreover, to completely answer the research question, it is interesting to focus on cases in which both states possess nuclear weapons. The cases in which both the initiator and defender possess nuclear weapons are combined in group 2. If subsequently this group is compared to group 3, then group 2 is associated with more successes. On the other hand, if group 2 is compared to group 1, then group 2 is associated with more failures. Lastly, if group 2 is compared to group 4, then group 2 is again linked to more successes. This finding cannot be

explained by using the theory mentioned earlier. According to Rauchhaus (2009, p. 270) the chance on crisis initiation and limited uses of force increases if both states possess nuclear weapons. However, this finding contradicts that. It is therefore interesting that cases in which both states possess nuclear weapons succeed more often than that they fail. To explain this, further research is necessary.

Only a nuclear defender

However, since no previously conducted research focused on compellence cases with only a nuclear defender state, it is most interesting to look at these cases. If the first group of cases (with only a nuclear defender) is compared to the other groups, the first group is associated with the most successes.

Admitting that the differences between the groups were not statistically significant, it is concluded that cases of the group containing a nuclear defender were the most successful of all groups. Remarkably, as mentioned before, the difference in successes between group 1 and group 3 has been found the greatest. To conclude, compellence cases in which only the defender possesses nuclear weapons succeed more often than other cases. In other words, if a nonnuclear state compels a nuclear state, the chance of this being successful is higher than if the nonnuclear state would compel another nonnuclear state.

This finding is surprising and cannot be explained by using the theory described earlier. As mentioned above, Rauchhaus (2009, p. 270) argues that if only one state possesses nuclear weapons, a greater chance of militarized disputes and wars exists. Based on this theory, one would expect that cases with a nuclear defender would fail more often. However, the opposite is true. Since former research never explicitly focused on compellence cases in which only the defender state possesses nuclear weapons, this finding is new and interesting. To be able to explain why this is as it is, further research could perform in-depth case studies. Maybe by looking at similarities between the cases, an explanation can be given about this high rate of success.

To finish, do compellence cases in which states possess nuclear weapons succeed more often than compellence cases in which states do not possess nuclear weapons? It is not possible to simply answer yes or no to this question. The distinction made in this thesis has therefore proven valuable. In short, compellence cases in which only the initiator state possesses nuclear weapons fail more often. Moreover, compellence cases in which both states possess nuclear weapons succeed more often compared to cases in which no state possesses

nuclear weapons. Lastly, the most interesting result of this thesis is that compellence cases in which only the defender state possesses nuclear weapons, succeed more often compared to all other cases.

This conclusion is a valuable addition to the existing literature. A lot of former research on coercion possibilities of nuclear weapons rather focussed on deterrence than on compellence. Moreover, if research did focus on compellence, mostly it did not distinguish between which state possesses nuclear weapons. Of course, some useful literature did exist, but this literature could not explain the findings of this research. Therefore, this research is a useful and maybe even crucial contribution to the existing literature.

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Appendix I

Table 3

Cases in which only initiator possesses nuclear weapons

Initiator	Defender	Year	Success
United States	Dominican Republic	1961	Yes
United States	Vietnam	1964	Yes
United States	North Korea	1968	No
United States	Cambodia	1975	No
United States	Iran	1979	Yes
United States	Panama	1989	No
United States	Iraq	1990	No
United States	Yugoslavia	1993	No
United States	Haiti	1994	No
United States	Yugoslavia	1994	Yes
United States	Iraq	1997	Yes
United States	Yugoslavia	1998	Yes
United States	Iraq	1998	No
United States	Afghanistan	1998	No
United States	Afghanistan	2001	No
United Kingdom	Saudi Arabia	1952	No
United Kingdom	Egypt	1956	No
United Kingdom	Argentina	1982	No
United Kingdom	Iraq	1990	No
United Kingdom	Yugoslavia	1993	No
United Kingdom	Yugoslavia	1994	Yes
United Kingdom	Yugoslavia	1998	No
United Kingdom	Iraq	1998	No
United Kingdom	Afghanistan	2001	No
France	Yugoslavia	1993	No
France	Yugoslavia	1994	Yes
France	Yugoslavia	1998	No

Russia	Yugoslavia	1949	No
Russia	France	1956	Yes
Russia	Czechoslovakia	1968	Yes
South Africa	Mozambique	1980	No
South Africa	Zambia	1985	No
South Africa	Zimbabwe	1985	No
South Africa	Lesotho	1985	Yes
South Africa	Botswana	1985	No
South Africa	Botswana	1985	No
Israel	Egypt	1967	No
Israel	Lebanon	1970	No
Israel	Lebanon	1972	No
Israel	Syria	1978	No
Israel	Syria	1981	No
China	India	1965	No
China	Vietnam	1979	No

Table 4

Cases in which only defender possesses nuclear weapons

Initiator	**Defender**	**Year**	**Success**
Turkey	United Kingdom	1963	Yes
Egypt	Israel	1969	No
Iceland	United Kingdom	1973	Yes
Iceland	United Kingdom	1975	Yes
Bangladesh	India	1981	Yes

Table 5

Cases in which both initiator and defender possess nuclear weapons

Initiator	Defender	Year	Success
Russia	United Kingdom	1956	Yes
United States	Russia	1969	Yes
Russia	China	1969	No
Russia	China	1969	No
United States	Russia	1970	Yes
Russia	China	1969	No
India	Pakistan	2001	Yes

Appendix II

```
DATASET ACTIVATE DataSet1.
DESCRIPTIVES VARIABLES=success
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Table 6

Descriptive statistics compellence success

	N	Minimum	Maximum	Mean	Std. Deviation
Success	242	0	1	,45	,499
Valid N (listwise)	242				

```
ONEWAY success BY Nuclear_groups
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /PLOT MEANS
  /MISSING ANALYSIS.
```

Table 7

Mean differences between the groups

Comparison	Mean difference
1 – 2	0,09
1 – 3	0,57
1 – 4	0,32
2 – 3	0,48
2 – 4	0,23
3 – 4	-0,25

Note. These mean differences are calculated based on Table 2

Table 8

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
success	Based on Mean	25,131	3	238	,000
	Based on Median	3,873	3	238	,010
	Based on Median and with adjusted df	3,873	3	234,780	,010
	Based on trimmed mean	25,131	3	238	,000

```
*Nonparametric Tests: Independent Samples.
NPTESTS
  /INDEPENDENT TEST (success) GROUP (Nuclear_groups)
KRUSKAL_WALLIS(COMPARE=PAIRWISE)
  /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE
  /CRITERIA ALPHA=0.05  CILEVEL=95.
```

Nonparametric Tests

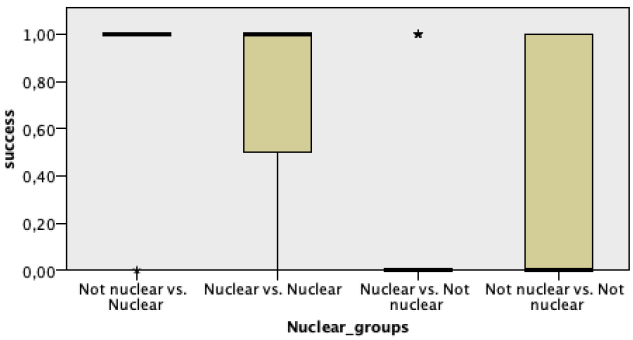
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of success is the same across categories of Nuclear_groups.	Independent-Samples Kruskal-Wallis Test	,003	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.

Figure 2. Kruskal-Wallis Test

Independent-Samples Kruskal-Wallis Test

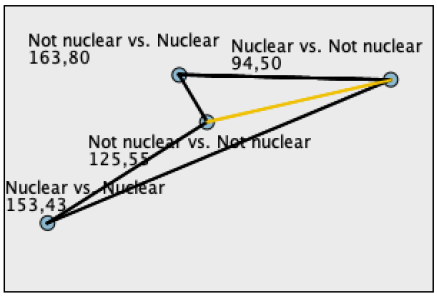


Total N	242
Test Statistic	14,071
Degrees of Freedom	3
Asymptotic Sig. (2-sided test)	,003

1. The test statistic is adjusted for ties.

Figure 3. Kruskal-Wallis Test

Pairwise Comparisons of Nuclear_groups



Each node shows the sample average rank of Nuclear_groups.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Nuclear vs. Not nuclear-Not nuclear vs. Not nuclear	-31,048	10,113	-3,070	,002	,013
Nuclear vs. Not nuclear-Nuclear vs. Nuclear	58,929	24,548	2,401	,016	,098
Nuclear vs. Not nuclear-Not nuclear vs. Nuclear	69,300	28,470	2,434	,015	,090
Not nuclear vs. Not nuclear-Nuclear vs. Nuclear	27,880	23,226	1,200	,230	1,000
Not nuclear vs. Not nuclear-Not nuclear vs. Nuclear	38,252	27,339	1,399	,162	,971
Nuclear vs. Nuclear-Not nuclear vs. Nuclear	10,371	35,324	,294	,769	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,05.
Significance values have been adjusted by the Bonferroni correction for multiple tests.

Figure 4. Post hoc Kruskal-Wallis Test