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State-Dissident Interactions: the Dynamics of Protest Campaigns and the Factors of their Success

SUMMARY OF THE DISSERTATION

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Statement of Research Problem[1]

Protest movements arise periodically, and sometimes even permanently exist, in almost all countries, since they are one of the ways to challenge power, which is inextricably linked with one form or another of competitive politics. Both authoritarian and democratic countries are forced to respond to this challenge, sometimes resorting to negative sanctions.

Empirical research into the relationship between protests and repression has a very long history, but key questions about both the factors that contribute to the victory of the protest movement and the factors that stimulate its demobilization still give rise to debate. There is still no clear answer to the question of what effect repression has on protests, since it is easy to find empirical evidence in favor of the fact that repression not only demobilizes the protest movement[2], but also stimulates the growth of protest activity[3].

The results of studies devoted to what characteristics of a protest favor a positive outcome for protesters are also contradictory[4]. For example, according to J. Earl's theory, the chances of a protest being successful are reduced if the authorities perceive it as a threat. Currently, it is believed that the threat of a social movement perceived by the authorities depends on the number of protesters[5], their use of violence[6] and the radicalism of their proclaimed goals[7]. In some empirical works this theory is confirmed[8], while in others it is seriously challenged[9].

There is reason to believe that the reasons for these inconsistencies lie in the scope of the methods used and the levels of data aggregation[10]. Econometric methods, which have gained popularity in political science and served as the basis for the vast majority of results on the study

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[1] This study uses the concepts of "repression", "protests" and "protest campaigns". Both specific negative sanctions of the authorities in relation to the protesters, which in this work are called repression, and specific street forms of mass expression of disagreement with the policies pursued by the authorities on economic, political, social and other issues, which in this work are protests or protest campaigns, I I do not evaluate and do not encourage evaluation from a moral or legal point of view.

[2] Jenkins J. C., Perrow C. Insurgency of the powerless: Farm worker movements (1946-1972) // American sociological review. – 1977. – C. 249-268.

[3] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152.

[4] Ayoub P. Repressing protest: threat and weakness in the European context, 1975-1989 // Mobilization: An International Quarterly. – 2010. – Vol. 15. – №. 4. – C. 465-488.

[5] McAdam D., Su Y. The war at home: Antiwar protests and congressional voting, 1965 to 1973 // American sociological review. – 2002. – Vol. 67. – №. 5. – C. 696-721.

[6] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. –C.54.

[7] Ayoub P. Repressing protest: threat and weakness in the European context, 1975-1989 // Mobilization: An International Quarterly. – 2010. – Vol. 15. – №. 4. – C. 465-488.

[8] For example, see: Ayoub P. Repressing protest: threat and weakness in the European context, 1975-1989 // Mobilization: An International Quarterly. – 2010. – Vol. 15. – №. 4. – C. 465-488; Earl J., Soule S. A., McCarthy J. D. Protest under fire? Explaining the policing of protest // American sociological review. – 2003. – C. 581-606.

[9] Chenoweth E., Stephan M. J. Why civil resistance works: The strategic logic of nonviolent conflict. – Columbia University Press, 2011.

[10] Chenoweth E., Perkoski E., Kang S. State repression and nonviolent resistance // Journal of Conflict Resolution. – 2017. – Vol. 61. – №. 9. – C. 1950-1969.

of protest mobilization, overlook the dynamic nature of the conflict between protesters and the authorities. As already noted, protest campaigns are long-term processes extended over time[11], which are characterized by information asymmetry between protesters and authorities at different stages of the conflict[12], the presence of "critical points" capable of qualitatively changing the confrontation[13], multidirectional short-term and long-term effects of the actions of authorities and protesters[14], mutual influence of the actions of the authorities and protesters on each other[15], which makes it difficult to use conventional regressions in their analysis. Modern databases also do not make it possible to study the dynamics of the entire conflict, since the level of coverage is either too high (the number of protests of one direction or another in a given year in a particular country, i.e. reaggregation) or too low (data on individual protest events, not tied to a specific campaign).

Thus, despite the large number of studies devoted to the relationship between protests and repression, the question of how the dynamics of protest campaigns affects their outcomes and how the dynamics of protest campaigns moderates the effect of repression towards protesters remains almost unexplored. The identified gap is the **research problem** of this study.

Literature review

Research devoted to the study of protests and repression can be divided into two types, which exist in parallel and, unfortunately, rarely intersect, which somewhat impoverishes scientific achievements. The first type examines the impact of a particular reaction of the authorities (usually repressive) on subsequent protest actions of opponents of the authorities and studies the factors contributing to both the suppression of protest and the mobilization of the population (for example, J. Sutton, C. Butcher and I. Swenson[16], K. Rusler[17], K. Sullivan , S. Loyle and K. Davenport[18], D. Hess and B. Martin[19]). The second group of studies, on the contrary, considers the reaction of the authorities as a dependent variable and involves identifying the role of the characteristics of the

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[11] Ахременко А. С., Беленков В.Е., Петров А. П. Логика протестных кампаний: от эмпирических данных к динамическим моделям (и обратно) // Полис. – 2021. – №. 3. – С. 147-165.

[12] Shadmehr M. 2014. Mobilization, Repression, and Revolution: Grievances and Opportunities in Contentious Politics. – Journal of Politics. Vol. 76. No. 3. P.621-635. https://doi.org/10.1017/S002238161400026

[13] Centola D., Becker J., Brackbill D., Baronchelli A. 2018. Experimental Evidence for Tipping Points in Social Convention. – Science. Vol. 360. No. 6393. P. 1116-1119. https://doi.org/10.1126/science.aas8827

[14] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – С. 132-152.

[15] Rasler K. A. Dynamics, Endogeneity, and Complexity in Protest Campaigns // Oxford Research Encyclopedia of Politics. – 2017. – С. 1-26.

[16] Sutton J., Butcher C. R., Svensson I. Explaining political jiu-jitsu: Institution-building and the outcomes of regime violence against unarmed protests // Journal of Peace Research. – 2014. – Vol. 51. – №. 5. – С. 559-573.

[17] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – С. 132-152.

[18] Sullivan C. M., Loyle C. E., Davenport C. The Coercive Weight of the Past: Temporal Dependence and the Conflict-Repression Nexus in the Northern Ireland "Troubles" // International Interactions. – 2012. – Vol. 38. – №. 4. – С. 426-442.

[19] Hess D., Martin B. Repression, backfire, and the theory of transformative events // Mobilization: An International Quarterly. – 2006. – Vol. 11. – №. 2. – С. 249-267.

protest and other factors in the protesters achieving their goals (for example, J. Earl[20], F. Ayoub[21], E. Chinovert and M. Stefan[22], S. Dalum[23]).

Let us briefly review the current results of each approach. Thus, it is still impossible to say unequivocally about the effect of repression on protest movements. J. Jenkins and C. Perow[24], I. Bramsen[25] provided empirical evidence that repression can put an end to a protest campaign. On the other hand, K. Rusler[26], J. Sutton, C. Butcher and I. Swenson[27] provided empirical evidence in favor of the fact that repression only increases the activity of protesters and increases their numbers. The results of E. Muller's work[28] indicate the ambiguity of this relationship and the dependence of its results on the context, since they reveal a parabolic relationship (vertex up).

However, current research does not fully explain the contradictory impact of repression on protest mobilization. The classic explanation for the decline in protest activity after the use of repression is that negative sanctions increase the costs of protesters and limit their mobilization resource[29]. The phenomenon mentioned just above, indicating the possibility of intensifying protest (instead of suppressing it), is called differently in the literature: backfire effect[30], backlash effect[31], political jiu-jitsu[32] and this is not an exhaustive list, but let's stop at it for now. Researchers have not yet reached a consensus on what causes this effect, although several theories have been put forward and tested.

Thus, according to the micromobilization approach, which focuses on personal connections and interactions, the number of protesters and their activity increases due to the mobilization of

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[20] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. –C.54.

[21] For example, see: Ayoub P. Repressing protest: threat and weakness in the European context, 1975-1989 // Mobilization: An International Quarterly. – 2010. – Vol. 15. – №. 4. – C. 465-488.

[22] Chenoweth E., Stephan M. J. Why civil resistance works: The strategic logic of nonviolent conflict. – Columbia University Press, 2011.

[23] Dahlum S. Students in the streets: education and nonviolent protest // Comparative Political Studies. – 2019. – Vol. 52. – №. 2. – C. 277-309.

[24] For example, see: Jenkins J. C., Perrow C. Insurgency of the powerless: Farm worker movements (1946-1972) // American sociological review. – 1977. – C. 249-268.

[25] Bramsen I. Micro-Dynamics of Repression: How Interactions between Protesters and Security Forces Shaped the Bahraini Uprising // Scandinavian Journal of Military Studies (SJMS). – 2018. – Vol. 2. – №. 1. – C. 9-19.

[26] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152.

[27] Sutton J., Butcher C. R., Svensson I. Explaining political jiu-jitsu: Institution-building and the outcomes of regime violence against unarmed protests // Journal of Peace Research. – 2014. – Vol. 51. – №. 5. – C. 559-573.

[28] Muller E. N. Income inequality, regime repressiveness, and political violence // American sociological review. – 1985. – C. 47-61.

[29] Yuen S., Cheng E. W. Neither repression nor concession? A regime's attrition against mass protests // Political Studies. – 2017. – Vol. 65. – №. 3. – C. 611-630.

[30] Hess D., Martin B. Repression, backfire, and the theory of transformative events // Mobilization: An International Quarterly. – 2006. – Vol. 11. – №. 2. – C. 249-267.

[31] Sutton J., Butcher C. R., Svensson I. Explaining political jiu-jitsu: Institution-building and the outcomes of regime violence against unarmed protests // Journal of Peace Research. – 2014. – Vol. 51. – №. 5. – C. 559-573.

[32] Sullivan C. M., Loyle C. E., Davenport C. The Coercive Weight of the Past: Temporal Dependence and the Conflict-Repression Nexus in the Northern Ireland "Troubles" // International Interactions. – 2012. – Vol. 38. – №. 4. – C. 426-442.

small groups: this process starts if the applied repression was perceived by people as illegal or if members of the social group to which they belong that supports the protest were among those repressed[33]. Information theory suggests that the repressive policy of the authorities towards protesters changes citizens' opinions about the authorities, undermining their legitimacy[34]. From the perspective of socio-psychological theory, repression causes a strong emotional reaction from others, and these reactions mobilize new supporters of the protest[35].

The process of micromobilization can also be launched by the authorities pursuing an accommodative policy, that is, concessions towards the protesters. According to the theory of expected utility ("value-expectancy model") [36], if the expectation of citizens receiving a public good, which is the goal of a protest campaign, increases, then the likelihood of citizens participating in a protest also increases. And in this case, concessions by the authorities to the protesters will indicate the weakness of the authorities and the high probability of success of further protests, thereby stimulating mass participation in protests[37]. Although there is also contrary evidence in favor of the fact that accommodation can serve as an effective tool for demobilizing protest[38], as well as co-opting its leaders[39].

The second branch of research considers the authorities' reaction to protests as a dependent variable. This area has received significantly less attention from researchers, and it contains a larger number of "blank spots" due to the not so significant number of empirical studies, despite the fact that their results cannot be considered unambiguous. The classic theory that offers an explanation for the influence that protests have on the reaction of the authorities is the "Law of Coercive Responsiveness" [40] by K. Davenport, according to which the authorities decide to forcefully suppress only such a protest movement that challenges the existing status quo.

Less well known is the systematization proposed by J. Earl and based on the identification of three approaches from the existing literature: theory of weakness, theory of threat, theory of

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[33] Opp K. D., Roehl W. Repression, micromobilization, and political protest // Social Forces. – 1990. – Vol. 69. – №. 2. – C. 521-547.

[34] Lohmann S. The dynamics of informational cascades: The Monday demonstrations in Leipzig, East Germany, 1989–91 // World politics. – 1994. – Vol. 47. – №. 1. – C. 42-101.

[35] Aytaç S. E., Schiumerini L., Stokes S. Why do people join backlash protests? Lessons from Turkey // Journal of Conflict Resolution. – 2018. – Vol. 62. – №. 6. – C. 1205-1228.

[36] Muller E. N., Opp K. D. Rational choice and rebellious collective action //American Political Science Review. – 1986. – T. 80. – №. 2. – C. 471-487.

[37] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152.

[38] Demirel-Pegg T. The dynamics of the demobilization of the protest campaign in Assam // International Interactions. – 2017. – Vol. 43. – №. 2. – C. 175-216.

[39] Dollbaum J. M. Curbing protest through elite co-optation? Regional protest mobilization by the Russian systemic opposition during the 'for fair elections' protests 2011–2012 // Journal of Eurasian studies. – 2017. – T. 8. – №. 2. – C. 109-122.

[40] Davenport C. State repression and political order // Annual Review of Political Science. – 2007. – Vol. 10. – C. 7-10.

interaction[41]. The first concept states that if the authorities fail to suppress the protest, then their authority will be undermined, and, therefore, we should expect repression only against weak protests that cannot survive forceful pressure on them[42]. The second approach echoes the already mentioned "law of violent response" in that it asserts that repression will only be applied to those protests that are perceived by the authorities as threatening[43]. According to the third approach, which incorporates the previous two, repression will be applied to those protests that are perceived by the authorities as both weak and threatening[44].

The current results support the second[45] and sometimes the third[46] approach, although the number of empirical studies conducted is still too small to draw far-reaching conclusions. Moreover, as we have already noted, in the literature one can also find studies with theories and results that contradict J. Earl's[47] systemic approach or complement it (for example, evidence in favor of inclusion in the analysis of state capacity[48]).

This suggests that the problem of inconsistent results lies in the methods used.

As is easy to see, the dynamic component of protest campaigns, which could resolve the contradictions we have named in the relationship between protests and repression, remains outside the scope of modern works. In empirical works, taking into account the dynamic component is limited to the inclusion of lagged variables[49].

It is worth mentioning that considering the dynamics of the confrontation between protesters and the authorities as a factor influencing the outcomes is also difficult due to the limitations of the databases used in the works.

The only area of research, by and large, that focuses on the dynamics of protest campaigns is agent-based modeling. The first influential model of this kind was the civil uprising model of J.

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[41] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. – C. 44-68.
[42] Ibid., P.54.
[43] Ibid., P.54.
[44] Ibid., P.54.
[45] For example, see: Ayoub P. Repressing protest: threat and weakness in the European context, 1975-1989 // Mobilization: An International Quarterly. – 2010. – Vol. 15. – №. 4. – C. 465-488; Earl J., Soule S. A., McCarthy J. D. Protest under fire? Explaining the policing of protest // American sociological review. – 2003. – C. 581-606.
[46] Beers S. QCA as competing or complementary method? A qualitative comparative analysis approach to protest event data // International Journal of Social Research Methodology. – 2016. – Vol. 19. – №. 5. – C. 521-536.
[47] Chenoweth E., Stephan M. J. Why civil resistance works: The strategic logic of nonviolent conflict. – Columbia University Press, 2011.
[48] Aytaç S. E., Schiumerini L., Stokes S. Why do people join backlash protests? Lessons from Turkey // Journal of Conflict Resolution. – 2018. – Vol. 62. – №. 6. – C. 1205-1228.
[49] For example, see: Bell S. R., Murdie A. The apparatus for violence: Repression, violent protest, and civil war in a cross-national framework // Conflict management and peace science. – 2018. – Vol. 35. – №. 4. – C. 336-354; Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152.

Epstein[50], many of whose ideas were subsequently developed in the works of D. Siegel[51] (in terms of network design), Akhremenko-Petrov[52] (in terms of integrating more complex socio-psychological mechanisms of decision-making by agents).

Unfortunately, all of the above models are not flawless, if only for the reason that they ignore the endogenous nature of the repressive activity of the authorities (i.e., the dynamic component of the authorities' reaction) - one or another level of strength and frequency of repression is established exogenously for each simulation by the researcher, rather than stemming from the dynamics of the conflict. An exception here, perhaps, may be the models of information confrontation between the authorities and the opposition (but, alas, not protest mobilization) developed by A. P. Mikhailov, A. P. Petrov, O. G. Proncheva (Podlipskaya), which offer different strategies for the behavior of each of them. sides[53]. Consequently, there is an urgent need to create a theoretical and mathematical model of protest mobilization, within the framework of which repression would be endogenized.

In conclusion of the brief overview of the current state of the problem field, we will once again emphasize the key points indicating the importance of considering the dynamics of protest campaigns, which in this paper are understood as both individual dynamics of the number of protesters and the authorities' response, and their joint dynamics. Firstly, the order of events is of significant importance, since protest campaigns are long-term processes stretched out in time[54], which are characterized by information asymmetry between protesters and authorities at different stages of the conflict[55]. Secondly, within the framework of protest campaigns, there is interaction between authorities and protesters, which forms the dynamics of confrontation, but within the framework of this interaction, there is also a mutual influence of the actions of the authorities and protesters on each other[56], which, most likely, gives rise to the multidirectionality of the short-term

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[50] Epstein J. M. Modeling civil violence: An agent-based computational approach // Proceedings of the National Academy of Sciences. – 2002. – Vol. 99. – №. suppl 3. – С. 7243-7250.

[51] Siegel D. A. Social networks and collective action // American Journal of Political Science. – 2009. – Vol. 53. – №. 1. – С. 122-138.

[52] Akhremenko A., Petrov A. Modeling the Protest-Repression Nexus // Modeling and Analysis of Complex Systems and Processes. – MACSPro, 2020.

[53] For more details see: Михайлов А. П., Петров А. П. Ч., Подлипская О. Г. Сравнительный анализ стратегий в модели противоборства власти и оппозиции // Математическое моделирование. – 2022. – Т. 34. – №. 11. – С. 67-76; Петров А. П. Ч., Прончева О. Г. Моделирование выбора позиций индивидами при информационном противоборстве с двухкомпонентной повесткой // Математическое моделирование. – 2019. – Т. 31. – №. 7. – С. 91-108.

[54] Ахременко А. С., Беленков В.Е., Петров А. П. Логика протестных кампаний: от эмпирических данных к динамическим моделям (и обратно) // Полис. – 2021. – №. 3. – С. 147-165.

[55] Shadmehr M. Mobilization, Repression, and Revolution: Grievances and Opportunities in Contentious Politics. – Journal of Politics. – 2014. – Т. 76. – №. 3. – С.621-635.

[56] Rasler K. A. Dynamics, Endogeneity, and Complexity in Protest Campaigns // Oxford Research Encyclopedia of Politics. – 2017. – С. 1-26.

and long-term effects of the actions of the authorities and protesters[57]. Thirdly, protest rites are characterized by the presence of "critical points"[58] capable of qualitatively changing the confrontation, upon reaching which the behavior of the social system changes, the study of which is not possible without analyzing the dynamics. In the course of analyzing existing work, having noticed that a full-scale study of the role of the dynamics of interaction between protesters and authorities as a factor in assessing the outcome of protest campaigns has not yet been undertaken in any of the empirical studies known to us, we proceed to formulate the **research question** of the work. It is about how the dynamic component of protest campaigns a) directly affects their outcomes and b) moderates the impact of repression on their results. Note that the dynamic component of the protest campaign is reflected in three aspects: the dynamics of the number of protesters, the dynamics of the reaction of the authorities, and the joint dynamics of the number and reaction of the authorities.

Note that in this paper, the dynamic component of protest campaigns and patterns of protest campaigns are synonymous concepts, since by a pattern we mean a change in the characteristics of interest to us over time. For patterns of government reaction – the dynamics of the level of negative sanctions, for patterns of numbers – the dynamics of the number of protest participants, for a pattern of protest campaigns – the joint dynamics of negative sanctions and the number of protest participants.

The **object** of the study is the dynamics of protest campaigns, which includes both the dynamics of the number of protesters and the reactions of the authorities. The **subject** of the study is the influence of patterns of protest campaign dynamics on the outcomes of protest campaigns.

The **aim** of this work is to study the influence of the dynamic component of protest campaigns on their outcomes and on the effect of repression against protesters.

To achieve this **aim**, it was necessary to solve the following **tasks**:

1. Create a theoretical model of the authorities' endogenous reaction to protest activity and implement it into a mathematical model of protest mobilization.
2. Conduct a computational experiment to obtain numerical data on the progress of protest campaigns in the context of the dynamics of numbers and reactions of the authorities. Using data obtained as a result of a computational experiment, identify dynamic patterns of the authorities' reaction, the size and development of the protest campaign.

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[57] Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152.

[58] Centola D., Becker J., Brackbill D., Baronchelli A. 2018. Experimental Evidence for Tipping Points in Social Convention. – Science. Vol. 360. No. 6393. P. 1116-1119. https://doi.org/10.1126/science.aas8827

3. Study existing databases on protest events, select the appropriate one from among them and, on its basis, collect a database on protest campaigns for subsequent analysis of their dynamics. Using “ideal patterns” obtained computationally, identify similar patterns in empirical data.

4. Based on the identified patterns of protest campaigns in the empirical data, test the hypotheses that the patterns of protest campaigns influence the outcomes of protest campaigns, and that the patterns of protest campaigns moderate the effects of repression on the outcomes of protest campaigns.

5. Based on the identified patterns of protest campaigns in the empirical data, test the hypotheses that the patterns of government response influence the outcomes of protest campaigns, and that the patterns of government response moderate the effects of repression on the outcomes of protest campaigns.

The following assumptions are the **hypotheses** of this study:

Hypothesis 1. When the intensity of repression alternates between high and low, the probability of a protest campaign being successful is increased.

Hypothesis 2. When the intensity of repression continually increases, the probability of a protest campaign being successful is increased.

Hypothesis 3. When the intensity of negative sanctions is constant, the higher their level, the lower the probability of a protest campaign being successful.

Hypothesis 4. If both the intensity of negative sanctions and the number of protesters increase during a protest campaign, the probability of a protest campaign being successful increases.

Hypothesis 5. If during a protest campaign the authorities reduce the level of repression in response to a decrease in the number of protesters and increase repression in response to an increase in the number, the probability of a protest campaign being successful decreases.

Hypothesis 6. If both the intensity of negative sanctions and the number of protesters increase during a protest campaign, the probability of a protest campaign being successful decreases with an increase in the maximum level of repression.

Theoretical frame and design

We turn to computational modeling techniques[59] to discover patterns of protest campaign dynamics under controlled conditions and based on explicit theoretical assumptions.

[59] Epstein J. M. Modeling civil violence: An agent-based computational approach // Proceedings of the National Academy of Sciences. – 2002. – Vol. 99. – №. suppl 3. – С. 7243-7250.

More specifically, we use agent-based models that allow agents to be given various decision-making mechanisms, depending on the state of the system in which they exist and the positions of other agents, which allows one to identify emergent properties systems[60] , i.e. macroscopic properties that are not attributed to each individual element of the system, but "grow" out of their combined and interdependent behavior[61].

We relied most on theoretical model of the dynamics of conflict between protesters and authorities, created by A. Akhremenko and A. Petrov[62].

The theoretical basis of the model of A. Akhremenko and A. Petrov is the social identity model of collective action (SIMCA), developed by M. Van Zomeren and colleagues[63]. She suggests that collective action is driven by three social-psychological factors: perceived injustice, belief in the success of the common cause (self-efficacy), and shared identity with movement participants.

The government decision-making systems we have developed are based on the classic work of J. Earl[64], namely the theory of threat. We also use retrospective voting theory to develop some additional strategies[65].

We use collective action theory to formulate mechanisms for agents to make decisions about participating in a protest, taking into account their social environment[66].

Applications of mathematical graph theory are used in the work with the aim of including network factors in the model of protest mobilization, including such a factor as homophily in network topologies (within the framework of social selection theory)[67].

To overcome data noise, a new method for analyzing the dynamic interaction between protesters and authorities is proposed based on identifying patterns of protest campaigns using cluster analysis of time series. We initially applied it to computational data.

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[60] Ахременко А. С., Петров А.П., Жеглов С.А. Как информационно-коммуникационные технологии меняют тренды в моделировании политических процессов: к агентному подходу // Политическая наука. – 2021. – №. 1. – С. 12-45. (b).

[61] Bonabeau E. Agent-based modeling: Methods and techniques for simulating human systems //Proceedings of the national academy of sciences. – 2002. – Т. 99. – №. suppl_3. – С. 7280-7287.

[62] Akhremenko A., Petrov A. Modeling the Protest-Repression Nexus // Modeling and Analysis of Complex Systems and Processes. – MACSPro, 2020.

[63] Van Zomeren M., Postmes T., Spears R. Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives // Psychological bulletin. 2008. Т. 134. №. 4. С. 504.

[64] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. – С. 44-68.

[65] For example, see: Anderson C. J. The end of economic voting? Contingency dilemmas and the limits of democratic accountability // Annu. Rev. Polit. Sci. – 2007. – Vol. 10. – С. 271-296; Healy A., Malhotra N. Retrospective voting reconsidered // Annual Review of Political Science. – 2013. – Vol. 16. – С. 285-306.

[66]For more details, see the study by I. Kozitsyn on modeling the processes of opinion formation by agents: Kozitsin I. V. A general framework to link theory and empirics in opinion formation models // Scientific reports. – 2022. – Т. 12. – №. 1. – С. 5543.

[67] Robins G., Elliott P., Pattison P. Network models for social selection processes // Social networks. – 2001. – Т. 23. – №. 1. – С. 1-30.

The basic clustering method with which various approaches to cluster analysis of time series were used (which will be discussed below) was the *k*-means clustering method[68]. We based the choice of the optimal number of clusters on the basis of the "elbow" method[69] and the "silhouette" coefficient[70].

The patterns of protest campaigns that we discovered using computational data were studied at the next stage using empirical data. To identify factors that contribute to the development of a protest campaign within a particular pattern, we used statistical data analysis methods: linear and logistic regression.

Conceptualization and operationalization

We understand a protest campaign as two or more protest events occurring in a row, (1) connected by a common agenda, (2) taking place in one country, (3) not having a time gap of more than three months, (4) characterized by a certain number of protesters and reaction of the authorities.

The outcome of a protest campaign in the computational data was defined in three different ways as (a) survival of the protest campaign (i.e., the protest campaign retained a nonzero size when equilibrium was reached in the model); (b) the number of surviving protest campaigns; (c) the maximum number that occurred during the entire campaign.

The outcome of the protest campaign based on empirical data was determined in four different ways as (a) accommodation of the protesters' demands; (b) resignation of a minister/cabinet; (c) the maximum number that occurred during the entire campaign, among those campaigns that ended in accommodation; (d) the maximum number that occurred during the entire campaign.

Note that the accommodation of protesters' demands is the main way of operationalizing the success of the protest campaign; it is this target variable that is specified in the provisions submitted for defense. However, other ways of operationalizing the success of the protest campaign were also used to increase the validity of the study. As shown by the regression models, there is a positive statistically significant positive relationship between the survival of the protest campaign and its size based on the computational experiment data (see Table 13), and a statistically significant positive relationship is also found between the acceptance of protesters' demands and the size of the protest campaign based on the empirical data (see Table 14).

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[68] Steinley D. K-means clustering: a half-century synthesis // British Journal of Mathematical and Statistical Psychology. – 2006. – Vol. 59. – C. 1–34.

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[70] Zhou H. B., Gao J. T. Automatic method for determining cluster number based on silhouette coefficient // Advanced Materials Research, Trans Tech Publ. – 2014. – Vol. 951. – C. 227–230. doi:10.4028/www.scientific.net/AMR.951.227.

By the authorities' reactions to protest activity we mean negative state sanctions in relation to participants in protest campaigns, since, as we noted above, it is with the use of negative sanctions that some of the greatest uncertainties in the problem under study are associated. In the computational data, this indicator is a numerical variable from 0 to 1, in the empirical data categories, which were normalized on a scale from 0 to 1 in order of increasing repressive activity.

In the framework of this work, a pattern is understood as either the characteristic dynamics of the authorities' reaction, or the characteristic dynamics of the size of the protest campaign, or the joint dynamics of the authorities' reaction and the size of the protest campaign. In the first case, we will operate with the concept of "pattern of reaction of the authorities", in the second case – "pattern of numbers", in the third – "pattern of a protest campaign" or "pattern of the course of a protest campaign". These definitions allow us to include into consideration the dynamic components of protest campaigns.

Empirical data

Using the Mass Mobilization Protest Data (MMPD)[71], a database of protest campaigns was compiled, disaggregated by protest event level. We manually recoded this data into protest campaigns based on media reports.

The database we formed contains data on 283 protest campaigns that took place from 1990 to 2020 in 54 countries – the total number of protest events is 1328 observations. Based on text descriptions of the number, we also formed a variable for the number of protesters.

In the regression analysis, the following variables were used as control variables:

- Gross domestic product per capita at purchasing power parity (in 2011 dollar prices) according to the World Bank[72].
- Population density according to the World Bank[73].
- The first principal component of the five democracy indices of the Diversity of Democracy Project (proportion of explained variance - 0.975): deliberative, egalitarian, liberal, electoral and participatory democracy[74].

Theoretical Significance

[71] Clark D., Regan P. Mass Mobilization Protest Data // Harvard Dataverse, V3. 2016.
[72] World Development Indicators, The World Bank – 2019.
[73] World Development Indicators, The World Bank – 2019.
[74] Coppedge M., Gerring J., Knutsen C.H., Lindberg S.I. , Teorell J., Altman D., Bernhard M., Fish M.S., Glynn A., Hicken A., Lührmann A., Marquardt K.L., McMann K., Paxton P. , Pemstein D., SeimB., Sigman R., Skaaning S.-E., Staton J., Wilson S., Cornell A., Gastaldi L., Gjerløw H., Ilchenko N., Krusell J. , Maxwell L., Mechkova V., Medzihorsky J., Pernes J., von Römer J., Stepanova N., Sundström A., Tzelgov E., Wang Y., Wig T., Ziblatt D.V-Dem [Country-Year/Country-Date] Dataset v9 // Varieties of Democracy (V-Dem) Project. – 2019.

To begin with, we note that the patterns of protest numbers, government reactions, and protest campaigns as such, identified using cluster analysis on the data from computational experiments, have a high convergence with the patterns identified in a similar way on empirical data (see Section 3.3). The computational model is created based on explicit (1) assumptions about protester behavior, which are based on SIMCA theory[75], (2) assumptions about the formation of social ties between people, developed in accordance with social selection theory[76], (3) assumptions about government reactions, inspired by both threat theory[77] and the theory of retrospective political voting[78]. This confirms the validity of these theories for analyzing the dynamics of competitive politics.

Above, we also noted the discussion in the scientific community about the role of repression on protest activity. Given the inclusion of the factor of government reaction dynamics in the consideration of this issue, we can add the following. Let us emphasize that both camps were right, although the first claimed that increasing the intensity of repression demobilizes the protest movement[79], and the second - that it stimulates citizens to participate in it[80], but the researchers missed the factor of dynamics. In the framework of our work, we found that patterns of repressive activity matter. The reason is that the moment and the strength of negative sanctions are applied plays no less a role in the success of the protest campaign than their maximum strength.

On the other hand, the empirical results of our work partially confirmed the signal model of mass political action by S. Loman[81], who assumed that the authorities will make concessions to the protesters if their numbers exceed a critical threshold, which in turn contradicts the threat theory by J. Earl[82], which states that high numbers are a source of danger for the elites. We found

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[75] Van Zomeren M., Postmes T., Spears R. Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives // Psychological bulletin. 2008. T. 134. №. 4. C. 504.

[76] Robins G., Elliott P., Pattison P. Network models for social selection processes // Social networks. – 2001. – T. 23. – №. 1. – C. 1-30.

[77] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. – C. 44-68.

[78] For example, see: Anderson C. J. The end of economic voting? Contingency dilemmas and the limits of democratic accountability // Annu. Rev. Polit. Sci. – 2007. – Vol. 10. – C. 271-296; Healy A., Malhotra N. Retrospective voting reconsidered // Annual Review of Political Science. – 2013. – Vol. 16. – C. 285-306.

[79] For example, see: Jenkins J. C., Perrow C. Insurgency of the powerless: Farm worker movements (1946-1972) // American sociological review. – 1977. – C. 249-268; Bramsen I. Micro-Dynamics of Repression: How Interactions between Protesters and Security Forces Shaped the Bahraini Uprising // Scandinavian Journal of Military Studies (SJMS). – 2018. – Vol. 2. – №. 1. – C. 9-19.

[80] For example, see: Rasler K. Concessions, repression, and political protest in the Iranian revolution // American Sociological Review. – 1996. – C. 132-152; Sutton J., Butcher C. R., Svensson I. Explaining political jiu-jitsu: Institution-building and the outcomes of regime violence against unarmed protests // Journal of Peace Research. – 2014. – Vol. 51. – №. 5. – C. 559-573.

[81] Lohmann S. A signaling model of informative and manipulative political action // American Political Science Review. – 1993. – T. 87. – №. 2. – C. 319-333.

[82] Earl J. Tanks, tear gas, and taxes: Toward a theory of movement repression // Sociological theory. – 2003. – Vol. 21. – №. 1. – C. 44-68.

that an increase in the number of protesters during a protest campaign, on the contrary, is associated with the acceptance of the demands of the protesters by the authorities, but only if the intensity of repression also increases.

Statements to be defended

1. Patterns of protest campaigns influence the success of protest campaigns. If during a protest campaign the authorities reduce the level of repression in response to a decrease in the number of protesters and increase repression in response to an increase in their number, then there is an increased probability that the protest campaign will end with the authorities accepting the demands of the protesters. A similar effect occurs if during a protest campaign both the strength of repression and the number of protesters grow.

2. Patterns of protest campaigns moderate the effect of repression against protesters on the success of protest campaigns. If during a protest campaign both the intensity of negative sanctions and the number of protesters grow, then with an increase in the maximum level of repression the probability of the authorities accepting the demands of the protesters decreases.

3. Patterns of government reactions influence the success of protest campaigns. With alternating high and low levels of intensity of repression by the authorities, there is an increased probability of the authorities accepting the demands of the protesters. With a constant increase in the intensity of repression, there is an increased probability that the authorities will accept the demands of protesters.

4. Patterns of government response moderate the effect of repression against protesters on the success of protest campaigns. With a constant level of repression, the higher the maximum level of repression, the lower the probability that the authorities will accept the demands of protesters.

Novelty:

1. The author's theoretical (mathematical) model of the authorities' endogenous reactions to protest activity is proposed.

2. Patterns in protest activity, government reactions, and protest campaigns as such, first discovered in computational and empirical data, were used to analyze the outcomes of protest campaigns. The connections between patterns of protest campaigns and their outcomes, between patterns of government reactions and the outcomes of protest campaigns are analyzed, and how these patterns moderate the effect of repression against protesters on the outcomes of protest campaigns is also studied.

3. Original methods for initializing the network topology have been developed to regulate the level of homophily in the protest mobilization network.

4. A new method for analyzing the dynamic interaction between protesters and authorities was proposed and tested based on identifying patterns of protest campaigns.

5. The author's database on protest campaigns has been compiled, including information on the dynamics of numbers, the reaction of the authorities, the violence of protesters, the demands of protesters and the composition of protesters. This was done on the basis of a well-known database of protest events, which, as part of our work, were analyzed and collected into blocks of protest campaigns.

6. For the first time, cluster analysis methods were used to identify patterns of protest activity, government reactions and protest campaigns as such using computational and empirical data.

Published articles:

1. Zheglov S.A. Finding Patterns in the Dynamics of Protest Campaigns: Computational Modeling and Empirical Analysis // Sociology: methodology, methods, mathematical modeling (Sociology: 4M). – 2022. – N. 54-55. – P. 129-187. (In Russ.)

2. Petrov A., Akhremenko A., Zheglov S. Dual Identity in Repressive Contexts: An Agent-Based Model of Protest Dynamics // Social Science Computer Review. – 2023. – C. 08944393231159953.

3. Petrov A.P., Akhremenko A.S., Zheglov S.A., Kruchinskaia E. V. Is Network Structure Important for Protest Mobilization? Findings from Agent-Based Modeling // Monitoring of Public Opinion: Economic and Social Changes. – 2021. – N. 6. – P. 226-253.

4. Akhremenko A.S., Petrov A.P.Ch., Stukal D.K., Zheglov S.A., Khavronenko M.V. What bots can (and can't) do? Model of protest and counter-protest political mobilization // Politeia. – 2021. – N. 3 (102). – P. 172-194. (In Russ.)

5. Akhremenko A.S., Petrov A.P., Zheglov S.A. How information and communication technologies change trends in modelling political processes: towards an agent-based approach // Political science (RU). – 2021. – N. 1. – P. 12-45. (In Russ.)

Participation in conferences:

1. The Sixteenth International Conference "Management of Large-Scale Systems Development" (MLSD'2023), September 26-28, 2023, Petrov A.P., Zheglov S.A., Akhremenko A.S. "Dynamics of motivation of participants in long-term protest campaigns: a mathematical and numerical model."

2. The fifteenth international conference "Managing Large-Scale Systems Development" (MLSD'2022), September 26-28, 2022, Akhremenko A.S., Zheglov S.A., Petrov

A.P., Turobov A.V. "Internet shutdown during protests: a model of changing the network structure with an adjustable level of continuity of connections."

3. XXIII Yasin International Scientific Conference on Problems of Economic and Social Development, Moscow, Russia, from April 5, 2022 to April 22, 2022, Zheglov S.A. "Agent-oriented model of the dynamics of the protest campaign development: the experience of endogenization of repressions."

4. MACSPro'2021: International Scientific Conference on Modeling and Analysis Complex Systems and Processes, Moscow, Russia, December 16-18, 2021, Sergey Zheglov, «Computational Modeling of Protest Campaigns: How to Detect Patterns in their Dynamics?».

5. XXII April International Scientific Conference on Problems of Economic and Social Development, April 13-30, 2021, Moscow, Akhremenko A.S., Zheglov S.A. "Agent-based model of the dynamics of the protest campaign development: design, results of numerical experiments."

6. The Fourteenth International Conference on Managing Large-Scale Systems Development (MLSD’2021), Moscow, Russia, September 27, 2021 to September 29, 2021, Petrov A.P., Kruchinskaya E.V., Zheglov S.A., Akhremenko A.S. "Modeling Street Protest: Dynamics of the Number of Protesters and the Government's Response."

7. 2021 International Conference «Engineering Management of Communication and Technology» (EMCTECH), Vienna, Austria, 2021 A. Akhremenko, V. Belenkov, S. Zheglov «Impact of Digital and Traditional Social Networks on Protest Campaigns: Agent-based Computational Experiments».

8. PaCSS 2021, The fourth annual Politics and Computational Social Science (PaCSS) conference, online August 9-13, 2021, A. Akhremenko; A. Petrov; E. Kruchinskaya, S. Zheglov «Network Topology, Homophily and Protest Cascades: Findings from Agent-Based Modeling».

9. The Thirteenth International Conference "Managing Large-Scale Systems Development" (MLSD'2020), September 28-30, 2020, Akhremenko A.S., Zheglov S.A. "Testing Hypotheses about the Factors of Street Protest Effectiveness: A Combined Statistical Strategy."

Summary

Chapter 1 is devoted to an analysis of the current state of the research field on the relationship between protests and government reactions. Section 1.1 describes two different approaches to the study of this topic: the first focuses on the impact of repression on protesters (as a rule, we are talking about an increase or decrease in their numbers), and the second focuses on the influence of the characteristics of the protest event (number, composition of participants, etc. .) to the reaction of the authorities. This part of the work draws attention to the inconsistency and incompleteness of the current empirical results of both approaches.

Section 1.2 examines the methodological problems of studying the relationship between protests of repression, which, in our opinion, cause inconsistency and incompleteness of empirical results. The analysis of the literature revealed two main sources of difficulties that the researchers encountered. Firstly, modern methods of analyzing protest campaigns miss the factor of dynamics. The interaction between protesters and authorities is a process extended over time, consisting of successive events in the form of individual protests and specific reactions of the authorities to them. The reciprocal influence of the government's response on the size of the protest, and vice versa, during a protest campaign lasting over time, greatly limits the econometric methods of data analysis, which have become widespread in modern social science research. Second, existing empirical frameworks also limit the potential for research on protest campaigns. They may suggest either an excessively high level of aggregation of protest events (for example, at the country level - year), or a very granular level (for example, country - protest event - day). The first option excludes the possibility of studying the dynamics of the confrontation, and the second does not allow the researcher to easily connect disparate protest events into a single trail of the campaign. It is these two problems of studying the interaction between protesters and authorities that were overcome in our work.

The focus of Chapter 2 is on computational modeling to facilitate our empirical study of protest campaigns. Since the empirical data is very noisy, we saw the need to conduct preliminary computational experiments and then use them to detect population patterns, government reactions and protest campaigns. We have identified two significant shortcomings of existing computational models: the lack of dynamics in the intensity of repression and ignoring the fact that in real social graphs people are connected not absolutely by chance, but taking into account the similarity of their interests, attitudes, etc. In Section 2.1, a solution to the first of them is proposed, and It was we who developed a theoretical (mathematical) model of the authorities' reaction to the dynamics of the number of protesters. Five additional repressive strategies were identified (in addition to a constant level of repressive intensity):

1. "Switchable" – repression is applied when the increase in the number of protesters is positive and ceases to be applied as soon as the increase in number becomes negative, taking into account the time lag of decision-making.
2. "Proportional" - repression is applied from the very beginning, but its strength increases or decreases in proportion to the increase in numbers; the reduction in the level of repression begins taking into account the decision-making lag.
3. "Proportional +" – exactly like "Proportional", but the intensity cannot be reduced.
4. "Adaptive-0" – repression is not applied initially. Then the logic applies: if at the next moment in time the number of protesters has decreased, then the decision made does not

change, the previous level of repression is maintained; in the opposite case (positive increase in numbers): if repressions were turned on, then they are turned off (i.e. their strength is equal to zero), and if they were turned off, then they are turned on to the starting level.

5. “Adaptive-1” - repression is applied initially, but otherwise acts like “Adaptive-0”.

In the next section, we overcome the second drawback - we developed an algorithm for initializing a network graph taking into account the homophily of agents. Also in section 2.2 we described computational models of protest mobilization, into which we implemented the named innovations.

Section 2.3 is entirely devoted to the methods of cluster analysis of temporal data, which we further applied on both numerical and empirical data. The next paragraph contains a description of the computational experiments performed.

The following sections in Chapter 2 introduce the reader to the results of the statistical analysis of the numerical experiments performed. Section 2.5 examines how the chosen repressive strategy affects the probability of “survival” of a protest campaign (i.e., the proportion of model runs that end in a non-zero number) and the number of “surviving” protest campaigns. It was found that the Switchable and Adaptive-0 strategies significantly increase the probability of survival of a protest campaign, while the use of almost any strategy (except a constant level of repression intensity) reduces the number of surviving protests.

Section 2.6 identifies, using the previously stated cluster analysis methods, patterns in the number of protesters, patterns in the reaction of the authorities, and patterns in the course of protest campaigns as such. And the next paragraph analyzes the influence of the identified patterns on the completion of the protest campaign with one or another result.

The main part of the work ends with Chapter 3, which incorporates all the empirical subjects of this study. In Section 3.1 we justify the choice of empirical database for subsequent analysis. In this same paragraph, firstly, the technical details of this database are described in detail, and, secondly, its methodological limitations are spelled out in detail. The most significant of them is that the protest events are not combined in the database into protest campaigns, this work was carried out by us independently, the details of which are also contained in this paragraph, as well as other transformations carried out by us.

Section 3.2 conducts cluster analysis on empirical data. As a result, seven patterns in the number of protesters were identified (Figure A.1):

1. “Wave”: the number of protesters either increases or decreases during each protest event;

2. “Increasing”: the number of protesters increases with each protest event;

3. “Flash”: the number of protesters increases immediately after the first protest, after which it decreases and the protest campaign ends;

4. “Fade”: the protest campaign starts with the number of protesters, which tends to decrease after each protest event;

5. “Constant”: the number of protesters does not undergo significant changes from the very beginning of the protest campaign until the very end;

6. “Fade with a flash”: a protest campaign starts with the number of protesters, which tends to decrease after each protest event, but in the middle or at the end of the protest campaign there is a sharp one-time surge in numbers;

7. “Increasing with fading”: the number of protesters increases during each protest event, but after a certain point, attenuation occurs.

Also, 5 patterns of government reaction were identified (Figure A.2):

1. “Increasing”: the strength of repression increases over time, moving from small to large values;

2. “Flickering”: the strength of repression alternately increases and decreases;

3. “Constant”: the strength of repression is constant throughout the entire persecution campaign;

4. “Flash”: the strength of repression increases immediately after the first protest, after which it clearly and significantly decreases, and the protest campaign ends;

5. “Fade”: a protest campaign starts with high-power repression, which tends to decrease after each protest event.

We also found 11 patterns of protest campaigns as such (Figure A.3):

1. “Fade with a flash”: protest campaigns, the peak of which occurred in the first actions, after which the number only fell, but then increased once;

2. “Blitz”: the number of protesters in dynamics is decreasing quite quickly;

3. “Surviving”: the number of protesters remains stable;

4. “Flash: rapid growth and immediate decline in the number of protesters;

5. “Fluctuation”: the number of protesters fluctuates up and down, regardless of the level of repression;

6. “Exhaustion”: the number of protesters first increases and then decreases;

7. “Cat and mouse”: increased repression causes a decrease in numbers, which in turn causes a weakening of repression;

8. “De-escalation”: despite the increase in the number of protesters, the strength of repression weakens over the course of the campaign;

9. “Escalation”: both the number and strength of repression are growing;

10. “Increasing while the authorities are throwing”: quite frequent intensification and weakening of the repressive activity of the authorities, which do not in any way affect the growth in the number of protesters;

11. “Increase”: there is an increase in the number of protesters who have not yet been classified by us into other patterns.

Section 3.3 compares the results of cluster analysis based on empirical and computational data, i.e. Accordingly, certain patterns are revealed and features that are few in number, but still have the same place, are different in the level of protection.

In section 3.4, we pay great attention to the statistical analysis of the obtained data, namely, we include dynamics variables (i.e., identified patterns) in logistic regression models to identify success factors of protest strategies, which are operationalized by special methods: (1) accommodation of protesting demands, (2)) exhibition of the minister/government/president, (3) maximum demonstration of the pretense campaign ending in accommodation, (4) maximum observation of the protest campaign.

The main results of this section include:

1. Patterns of government response “Fade”, “Flickering”, “Increasing”, “Constant” increase the likelihood of accommodating the protesters’ demands. The “Flash” pattern of government response reduces the likelihood of accommodating the protesters’ demands. (Table B. 1, Model 2)

2. With the “Constant” pattern, an increase in the maximum level of repression is associated with a decrease in the probability of accommodation, and with the “Flash” pattern, on the contrary, with an increase. (Figure B. 1)

3. Increased repressive activity with the “Increasing” and “Constant” patterns of government reaction leads to a decrease in the maximum number of protesters. (Figure B. 2)

4. The course of a protest campaign according to the “Cat and Mouse” and “Escalation” patterns increases the likelihood that it will end in accommodation. (Table B. 2, Model 1)

5. The course of a protest campaign according to the “Surviving” pattern reduces the maximum number of protesters, and the course of a protest campaign according to the “Fluctuation” pattern increases it. (Table B. 2, Model 4)

6. Increasing the strength of repression reduces the likelihood of accommodation in the “Surviving” and “Escalation” protest campaign patterns, and increases it in the case of “Exhaustion.” (Figure B. 3)

At the conclusion of this work, the results were summed up. In it, we overcame two main problems that were identified in research on this topic: ignoring the dynamics of the confrontation

between the authorities and protesters as part of the analysis of the outcomes of this struggle and the inconsistency of the level of data aggregation for the task at hand.

A preliminary step for empirical analysis was to turn to computational methods in the social sciences. We also made some contribution to the development of computational models of protest mobilization, namely, an original mechanism for the reaction of the authorities (i.e., a strategy of repression) was first proposed and implemented and an algorithm was developed to take homophily into account when initializing the network graph. Based on the results of computational experiments, we identified patterns in the number of protesters, the reactions of the authorities and the course of protest campaigns, which we further discovered using empirical data.

In the course of the empirical analysis, in which the dynamic component was included, five out of six hypotheses were confirmed.

It was revealed which patterns of government reaction influence the success of protest campaigns. If there is an alternation of high and low levels of intensity of repression by the authorities, then there is an increased probability of accommodation of the demands of the protesters (*Hypothesis 1*). A similar effect occurs with a constant increase in the intensity of repression (*Hypothesis 2*).

It was also revealed which patterns of government reaction moderate the effect of repression against protesters on the success of protest campaigns. If the authorities maintain an unchanged level of negative sanctions, then the higher it is, the lower the probability of accommodation (*Hypothesis 3*).

It was revealed which patterns of protest campaigns influence the success of protest campaigns. If both the strength of repression and the number of protesters increase during a protest campaign, then there is an increased probability that the protest campaign will end in accommodation (*Hypothesis 4*). If during a protest campaign the authorities weaken the level of repression in response to a decrease in numbers and strengthen repression in response to an increase in numbers, then there is an increased (and not decreased, as we assumed in *Hypothesis 5*) probability that the protest campaign will end in accommodation.

It was revealed that the patterns of protest campaigns moderate the effect of repression against protesters on the success of protest campaigns. If during a protest campaign both the strength of repression and the number of protesters increase, then an increase in the maximum strength of repression increases the probability of accommodation of protesters' demands (*Hypothesis 6*).

Appendix A

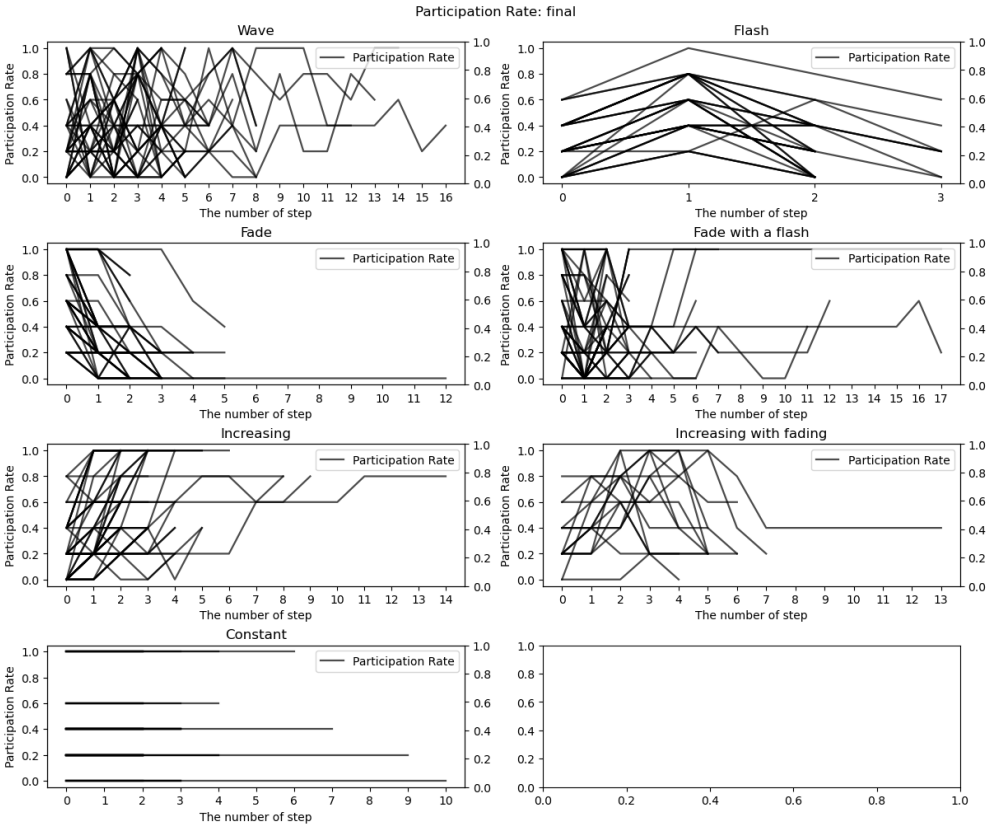

Figure 1. Dynamics of the number of protesters: final breakdown

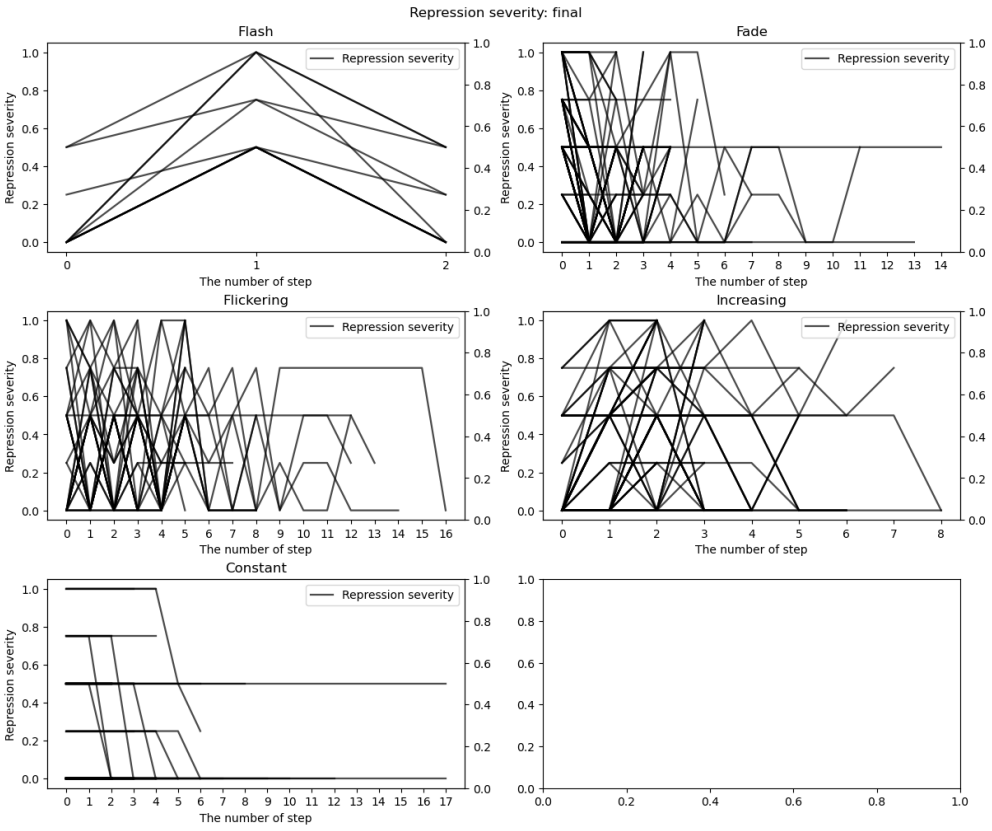

Figure 2. Dynamics of government reactions: final breakdown (abbreviated, final)

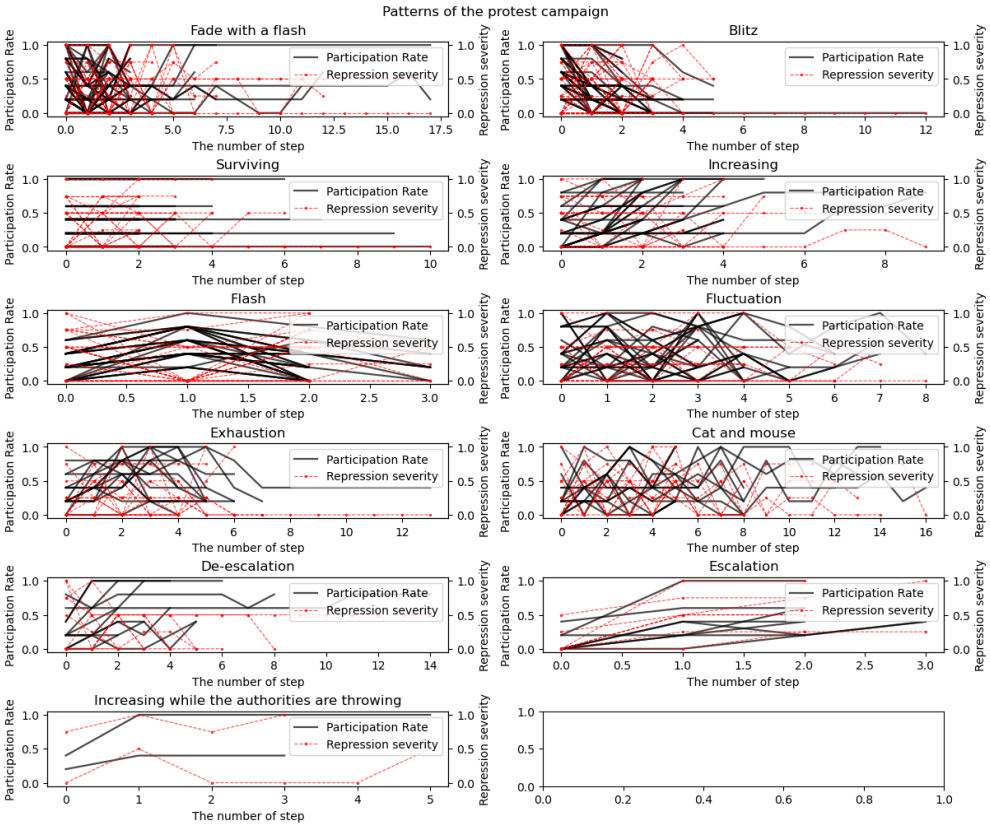

Figure 3. Protest campaign patterns: final version

Appendix B

Table 1. Results of the logistic regression (Model 1) model for accommodation of protest campaign demands; logistic regression (Model 2) model for a protest campaign that ended with the resignation of a minister/cabinet of ministers; linear regression model for the maximum number of protest campaigns that ended in accommodation (Model 3); linear regression model for the maximum number of protest campaigns (Model 4) for patterns of government reaction

	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INTERCEPT	-4.62	-94.81	-0.45	-0.12
	(3.06)	(3.79*10^4)	(1.61)	(0.37)
VIOLENCE BY PROTESTERS	0.91**		-0.07	0.03
	(0.38)		(0.14)	(0.05)
PATTERN «FADE»	4.94**	92.11	1.48	0.34
	(2.27)	(3.45*10^4)	(1.58)	(0.31)
PATTERN «FLICKERING»	5.55**	92.78	2.09	0.41
	(2.39)	(2.84*10^4)	(1.59)	(0.35)
PATTERN «INCREASING»	4.52**	94.04	1.79	0.46
	(2.28)	(4.02*10^4)	(1.58)	(0.31)
PATTERN «CONSTANT»	4.88**	93.97	1.35	0.32
	(2.14)	(3.6*10^4)	(1.56)	(0.30)
MAXIMUM LEVEL OF REPRESSION	4.90*	95.28	1.56	0.48
	(2.69)	(3.51*10^4)	(1.62)	(0.33)
MAXIMUM LEVEL OF REPRESSION*	-5.72**	-93.36	-1.53	-0.50
PATTERN «FADE»	(2.91)	(2.81*10^4)	(1.67)	(0.36)
MAXIMUM LEVEL OF REPRESSION *	-5.91*	-93.75	-2.23	-0.56
PATTERN « FLICKERING »	(3.10)	(3.26*10^4)	(1.68)	(0.42)
MAXIMUM LEVEL OF REPRESSION *	-5.32*	-95.38	-2.02	-0.73**
PATTERN «INCREASING»	(2.91)	(3.78*10^4)	(1.67)	(0.35)
MAXIMUM LEVEL OF REPRESSION *	-6.69**	-196.45	-1.11	-0.74**
PATTERN «CONSTANT»	(2.79)	(3.85*10^4)	(1.66)	(0.35)
GDP PER CAPITA, PPP	-0.15	-0.14	-0.04	0.04*
	(0.19)	(0.19)	(0.06)	(0.02)
LEVEL OF DEMOCRACY	0.47	0.10	0.11	0.03
	(0.36)	0.52)	(0.12)	(0.05)
POPULATION	-0.03		0.01	0.01
	(0.12)		(0.04)	(0.02)
N	284	284	80	284

***P <0.01, **P <0.05, *P < 0.1

Table 2. Results of the logistic regression (Model 1) model for accommodation of protest campaign demands; logistic regression (Model 2) model for a protest campaign that ended with the resignation of a minister/cabinet of ministers; linear regression model for the maximum number of protest campaigns that ended in accommodation (Model 3); linear regression model for the maximum number of protest campaigns (Model 4) for protest campaign patterns

	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INTERCEPT	-0.15	2.91	0.91	0.28
	(2.10)	(3.5)	(0.78)	(0.23)
VIOLENCE BY PROTESTERS		1.34*	-0.02	0.01
		(0.78)	(0.16)	(0.05)
PATTERN «FLASH»	0.51	0.01	-0.23	-0.06
	(1.19)	(2.36)	(0.69)	(0.12)
PATTERN «DE-ESCALATION»	1.14	0.23	-0.36	-0.04
	(1.77)	(2.64)	(0.79)	(0.30)
PATTERN «SURVIVING»	1.51	1.74	-0.40	-0.25**
	(0.99)	(2.48)	(0.41)	(0.11)
PATTERN «FADE WITH A FLASH»	1.23	3.30	0.15	0.04
	(1.04)	(2.43)	(0.40)	(0.11)
PATTERN «EXHAUSTION»	0.70	-0.59	0.09	0.11
	(1.37)	(3.49)	(0.52)	(0.16)
PATTERN «FLUCTUATION»	1.44	1.47	0.13	0.30***
	(1.26)	(2.39)	(0.40)	(0.11)
PATTERN «CAT AND MOUSE»	5.87**	3.25	0.23	0.19
	(2.72)	(3.01)	(0.83)	(0.37)
PATTERN «INCREASING»	0.82	0.88	0.03	-0.03
	(1.10)	(2.38)	(0.43)	(0.12)
PATTERN «INCREASING WHILE THE AUTHORITIES ARE THROWING»			0.65	0.72
			(0.99)	(7.38)
PATTERN «ESCALATION»	31.50***		0.37	-0.06
	(2.93)		(0.54)	(0.37)
MAXIMUM LEVEL OF REPRESSION	1.37	0.77	-0.11	-0.08
	(1.27)	(2.78)	(0.44)	(0.14)
MAXIMUM LEVEL OF REPRESSION * PATTERN « FLASH »	-1.71	-1.70	0.00	0.04
	(1.87)	(2.81)	(1.28)	(0.18)
MAXIMUM LEVEL OF REPRESSION * PATTERN « DE-ESCALATION »	-0.59	1.70	0.25	0.14
	(2.56)	(3.62)	(1.21)	(0.46)
MAXIMUM LEVEL OF REPRESSION * PATTERN «SURVIVING»	-2.78*	-3.78	0.92	0.02
	(1.55)	(3.92)	(0.58)	(0.18)
MAXIMUM LEVEL OF REPRESSION * PATTERN « FADE WITH A FLASH »	-1.85	-7.65**	-0.31	-0.09
	(1.54)	(3.82)	(0.55)	(0.17)
MAXIMUM LEVEL OF REPRESSION * PATTERN « EXHAUSTION »	1.49	3.29	0.08	0.11
	(2.11)	(4.55)	(0.65)	(0.24)
MAXIMUM LEVEL OF REPRESSION * PATTERN « FLUCTUATION »	-1.77	-2.09	0.04	-0.43**
	(2.09)	(3.04)	(0.58)	(0.18)
MAXIMUM LEVEL OF REPRESSION * PATTERN « CAT AND MOUSE»	-6.40*	-4.10	-0.13	-0.18
	(3.39)	(4.20)	(1.21)	(0.48)
MAXIMUM LEVEL OF REPRESSION * PATTERN «INCREASING»	-2.35	-	0.47	0.15
	(2.11)	104.38***	(0.55)	(0.22)

		(5.23)		
MAXIMUM LEVEL OF REPRESSION * PATTERN « INCREASING WHILE THE AUTHORITIES ARE THROWING»			-0.83 (1.47)	-0.84 (7.53)
MAXIMUM LEVEL OF REPRESSION * PATTERN « ESCALATION »	- 117.63*** (5.72)		0.09 (0.13)	-0.06 (0.46)
GDP PER CAPITA, PPP	-0.22 (0.19)	-0.12 (0.27)	-0.01 (0.08)	0.04* (0.02)
LEVEL OF DEMOCRACY	0.56 (0.36)	-0.38 (0.56)	0.13 (0.17)	0.02 (0.05)
POPULATION	-0.02 (0.13)		-0.03 (0.04)	0.01 (0.02)
N	282	274	80	284
***P <0.01, **P <0.05, *P < 0.1				

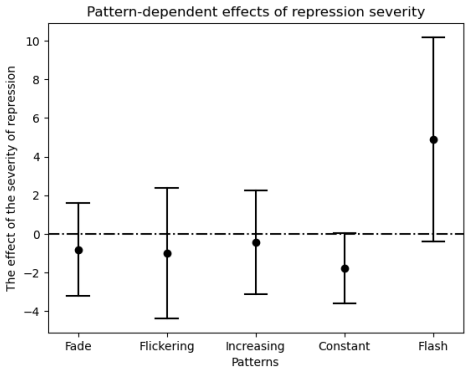

Figure 1. The effect of the strength of repression on the likelihood of accommodation of the demands of participants in protest campaigns depending on the pattern of the authorities' reaction

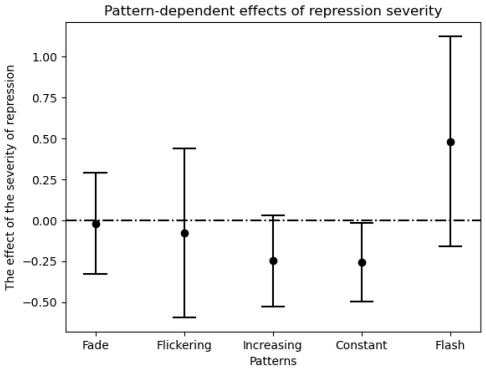

Figure 2. The effect of the strength of repression on the maximum number of protest campaigns depending on the pattern of government response

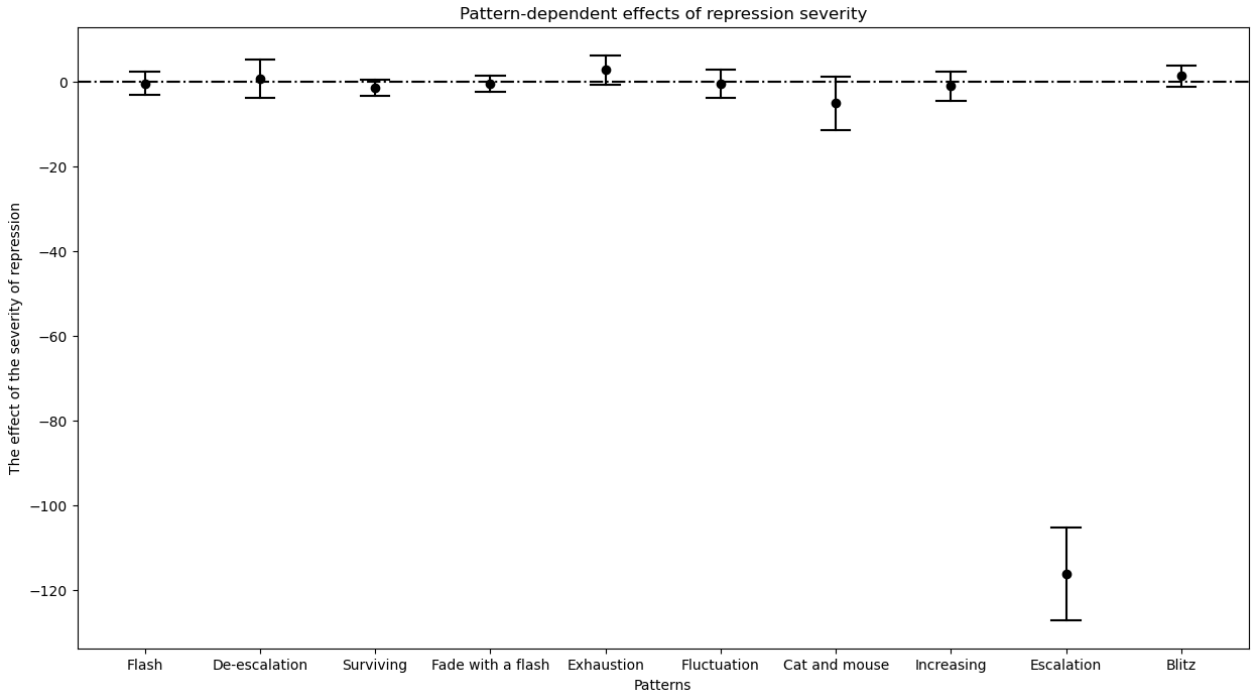

Figure 3. The effect of the strength of repression on the likelihood of accommodation of the demands of participants in protest campaigns depending on the pattern of the protest campaign