Using Computational Modeling to Examine Shifts Towards Extremist Behaviors in European Diaspora Communities

Asmeret Bier Naugle and Michael L. Bernard

Abstract We created a simulation model to investigate potential links between the actions of violent extremist organizations (VEOs), people in the VEO's home country, and diaspora communities from that country living in the West. We created this model using the DYMATICA framework, which uses a hybrid cognitive-system dynamics modeling strategy to simulate behaviors based on psycho-social theory. Initial results of the model are given, focusing on increases to VEO funding and recruiting resulting from an invasion of the VEO's home country. Western intervention, prejudice, and economic drivers are also considered.

1 Introduction

Middle Eastern diaspora communities residing in the West have recently received a great deal of media attention regarding the potential for some individuals to become radicalized. In extreme cases, this can lead to a some of these individuals becoming terrorists within their own communities, as well as a possibility that radicalized individuals will join international violent extremist organizations (VEO) in conflict with Western nations. The road to radicalization is typically a complex one, consisting of variables such as local pressures to fit in, perceived social, economic, and institutional prejudice and harm, desire for affiliation, social isolation, and ideological justifications. This type of environment can help frame the socio-cultural context for an individual, which can be highly salient and highly subjective, dependent on the history of the individual. A question then arises: to what degree

A.B. Naugle (✉) · M.L. Bernard
Sandia National Laboratories, Albuquerque, NM, USA
e-mail: abier@sandia.gov

M.L. Bernard
e-mail: mlberna@sandia.gov

do these types of variables affect the individual's propensity to either affiliate within European society or to resist European societal norms? Even further, which conditions are likely to lead to an individual actively seeking to commit violent acts of terrorism? Accordingly, the intent of this work is to explore how various diaspora communities understand their realities and investigate why they choose to either support or resist their host societies over time.

Using engineering and social science techniques, this effort is quantifiably assessing current events and choice options ("what-if" queries) concerning geopolitical inter-group/regional dynamics within diaspora communities. More specifically, this effort is considering how events, perceptions, and attitudes affect radicalization likelihood for diaspora communities in Western countries, and how radicalization may induce behavioral shifts pushing individuals toward interaction with VEOs. The computational model assesses both moderate diaspora communities and more militant diaspora groups. It addresses the conditions that attract more moderate members towards militant groups within the host country, as well as the conditions that may attract more militant individuals toward international VEOs. Variables that are included within the model include perceived Western prejudice towards Islam, VEO recruitment activities, economic opportunities, social isolation, and military conflict within or near the home country.

The preliminary model has so far been used to look at the effects of military activity in the diaspora's home country on funding and recruitment to VEOs. Early results indicate that such military activity is likely to increase political alignment with the VEO, thus increasing recruitment. Remittances to families and organizations are likely to increase, as is funding to the VEO from diaspora communities. The VEO thus gains overall strength from the military activity, even while losing some funding and personnel due directly to the same military activity. The model is still in preliminary form, and results should be considered illustrative rather than predictive.

2 Diaspora Communities Within Europe, and Recent Challenges

Europe has a long history of accepting migrants into its borders. The flow of immigrants from other parts of the globe has recently accelerated, mostly due to migrants from the Middle East and Africa. For example, Europe (particularly Germany and France) has recently taken in large waves of immigrants from Syria, Afghanistan, Iraq, and Eritrea [1]. This is expected to put a strain not only on government services and the general society within these areas, but also on existing diaspora communities. More specifically, existing diaspora (and other) communities will have to share a limited pool of government services and resources with the incoming diaspora. New migrants may also bring with them the psychological

aftermath of violent conflict and poverty, potentially adding to the need for greater services and resources [2]. In addition, most of the recent immigrants have been young [3, 4] and male. While there is potential for this to benefit Europe by contributing to economic growth and slowing overall population aging, this demographic, along with changes to sex ratios caused by the relative homogeneity of the migrant group, tends to contribute disproportionately to instability, violence, and insurgence [5].

On top of these challenges, Western governments and societies must determine how to deal with the small but concerning portion of the diaspora population (both existing and new) that has been receptive to the lure of VEOs. For example, there are instances of men and women in their early 20s quietly leaving their families and friends to join VEOs, such as ISIS in Syria and Iraq, Boko Haram in Nigeria, or al-Shabaab in Somalia [6, 7]. Moreover, it is known that at least some of the funding for terrorist activities in these regions has been routed through remittances sent by diaspora communities in Western countries [8].

This leads to the question of what circumstances drive individuals, who migrate from the Middle East to Europe, to either assimilate within the European culture or reject it in favor of extremist behaviors. Better understanding these circumstances can enable Western governments to better prepare and equip themselves with policies and programs that reduce the likelihood of a shift towards extremist behaviors.

2.1 Questions of Interest

Our modeling and assessment seeks to address the following questions. The assessment described here is an initial version, and may not yet address all of these. However, the model structure is designed to allow policy evaluation and other assessment activities that will contribute to answering these questions.

(1) What factors are likely to contribute to determining VEO recruitment and funding from diaspora communities?
(2) How might Western actions influence perceived Western prejudice toward Islam, thus affecting VEO recruitment and funding from diaspora communities?
(3) How might Western intervention in the Middle East/North Africa affect VEO recruitment and funding from diaspora communities?
(4) How does the balance of remittances from diaspora communities to families and non-violent organizations within the original homeland versus VEOs affect VEO recruitment?

2.2   Initial Scenario

This assessment is based on a scenario intended to focus the work by providing a context and initiating event. The scenario involves occupation by foreign military troops in the area of interest (the home country of the associated diaspora in the model). A 10-year time horizon was selected in order to capture both short-term and longer-term interactions of VEOs with the diaspora, influenced by both exogenous and endogenous variables.

2.3   General Motivations of Diaspora Communities Integrated into European Society

We consider two general groups of diaspora communities: one that is relatively integrated in its host society, and one that remains relatively isolated. While these groups are not necessarily well defined, the concept is useful for identifying motivations and behavior patterns that tend to be associated with one of these mindsets. There are certainly cases where motivations attributed more strongly to one group are also of concern to the other, or where individuals could be considered as belonging to either group, but considering the groups separately allows for more useful discussion and simulation of the situation.

For many in the more-integrated diaspora community, providing financial support for themselves and their families is a strong behavioral motivator. For example, the Somali diaspora within Europe alone provide at least $1.6B in annual remittances to families within Somalia. This is in line with the traditional obligation to their extended family group. Doing this provides critical support to the Somali society [9]. For diaspora communities that are more integrated within the larger European society, another motivation can be to appropriately blend Western culture and Islamic religion. Often, these communities will attempt to embrace what is most valued in both worlds. This can lead to a sense of confusion regarding what culture and lifestyle to embrace, and to publically express, at any giving time [10]. It also can cause conflict between families and generations regarding what to embrace. A sense of honor and dignity is also typically very important within these communities. A perception of widespread prejudice and discrimination can thus have a pronounced affect on the behaviors of the community, particularly its youth [11].

2.4   General Motivations of Diaspora Communities Isolated from European Society

More isolated diaspora communities will typically follow the obligation to their extended family groups, and will uphold their sense of honor and resistance to

prejudice and discrimination. However, because of their isolation, their contact with Western society can be minimal. Instead, they tend to have a greater desire for isolation from and resistance to the West and its perceived anti-Islam, anti-Middle East foreign policies. This includes policies and secularist laws within Europe that are perceived as discriminatory and insulting toward Islam and Muslims. This can be particularly true for individuals who feel marginalized by society due to unemployment or underemployment. This perception can be particularly strong among Muslim youth, where there is a general belief that Islam can and should guide the important behaviors of society. Another common belief is that the function of government should be to promote socially appropriate behaviors. This notion is most prominent in the teachings of political Islam. The main belief underlying political Islam is that Muslims can only truly fulfill their religious obligations when public (Sharia) law sanctions and encourages pious behavior. What this actually means is often a function of the local culture. Thus, for those who follow a more strict interpretation of the Koran, the secular laws of the West can be thought of as promoting a corrupt and immoral society [12]. Consequently, those who strongly espouse traditional political Islam commonly see Western laws as a potential threat to Islamic society and their communities.

More isolated, conservative groups may also see other, less strict interpretations and practices of Islam as potential a threat by their perceived appeasement to Western values, and potentially as a greater threat than the West itself. That is, the perceived acceptance by Islamic communities to Western, secular values can cause a spiritual and moral decay that would be more detrimental to Islamic communities than any direct confrontation through the laws and general power of Western governments.

Another factor influencing the decision making, and ultimately the behaviors, of individuals are contextual situations that help frame one's environment. For example, in diaspora communities factors such as poverty and discrimination can inflame attitudes and encourage more militant behaviors. As stated by Hroub [13], "in understanding and explaining Islamist movements, are we better served by relying on an understanding of their context or an analysis of their ideology? The easy answer, of course is 'both,' because these two undertakings should not be mutually exclusive." Accordingly, the combination of societal distrust, perceived discrimination, unemployment or underemployment, and youths propensity to congregate can make for a potentially dangerous situation of militant extremism.

2.5 The DYMATICA Simulation Framework

To model and simulate this system, we used a cognition-oriented system dynamics approach called the Dynamic Multi-scale Assessment Tool for Integrated Cognitive-behavioral Actions (DYMATICA). The theoretical framework of DYMATICA is based on well-established psychological, social, and economic
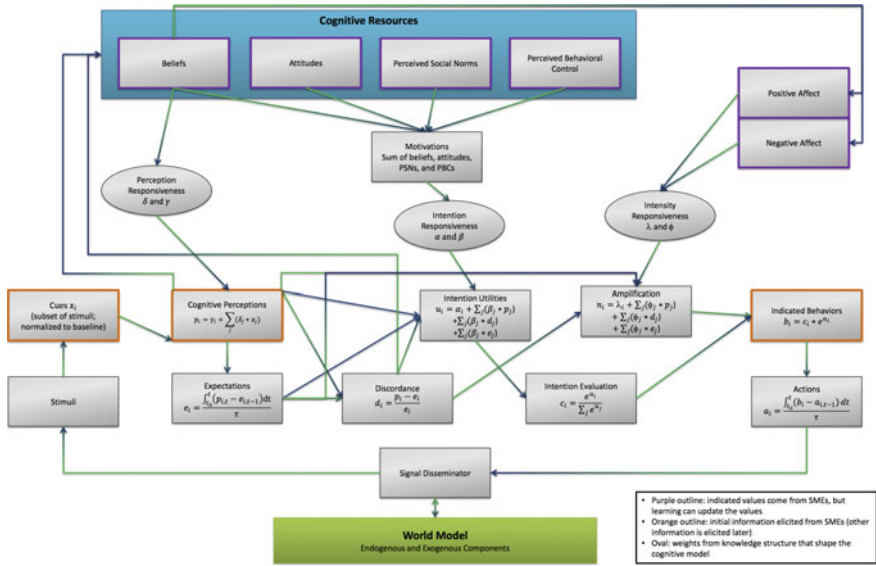
Fig. 1 Computational structure of DYMATICA

theories that have been incorporated into a single structure (Fig. 2) that is both self-consistent and dynamic. Cognitive models are implemented using system dynamics and embedded into an encompassing system dynamics model, which simulates interactions between people, groups, and physical, economic, or other system components (Fig. 1).

The cognitive portion of DYMATICA begins with individuals or groups being exposed to cues (stimuli relevant to the decision-maker). These cues are processed to create cognitive perceptions, the decision-maker's assessment of the world or situation. Over time, cognitive perceptions become expectations, which are compared to cognitive perceptions to determine discordance with the current situation. Discordance and cognitive perception affect beliefs, a category of cognitive processes that includes the components of the theory of planned behavior (attitudes, social norms, perceived behavioral control) [14] and affect. Intentions are calculated using utility functions. A multinomial logit function [15] compares intentions to determine realized behaviors, and over time those behaviors become physical realized actions. One of these cognitive models is populated for each individual or group being included in the system. These cognitive models are connected to each other and to a world model sector using system dynamics. The world model sector includes all of the non-cognitive components of the system of interest, including physical systems, economics, etc. Outputs from the world model and the cognitive models act as inputs, or stimuli, for the cognitive model in subsequent time steps.
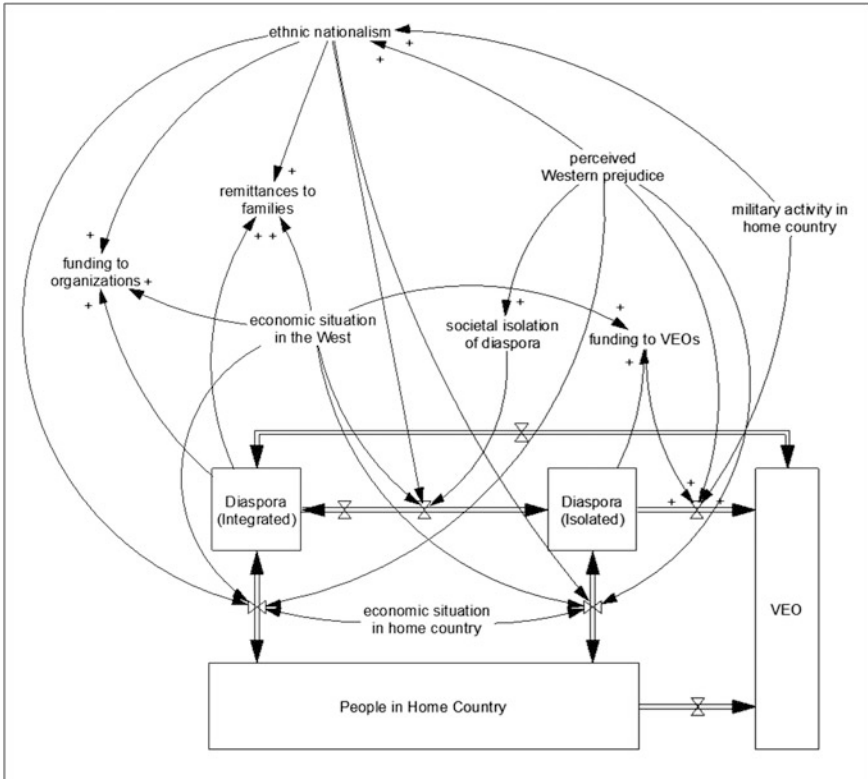
Fig. 2 Basic structure of the diaspora model

2.6 The Diaspora Model

We used the DYMATICA framework to model and simulate interactions between a VEO, the isolated and integrated diaspora communities, and people in the home country of interest. We assume that people in the home country can move to either diaspora community, and vice versa. These moves will be affected by economic situations in the west and the home country, as well as ethnic nationalism and perceived Western prejudice. People in the more integrated and more isolated diaspora communities can also move between those communities, behavior largely determined by ethnic nationalism, societal isolation of the diaspora in general, and the economic situation in the West. People in the home country may choose to join the VEO, as may people in the isolated diaspora community. These shifts will be determined by perceived Western prejudice, VEO funding, and military activity in the home country. The diaspora communities have a large affect on the situation at home through sending remittances to their families, funding to organizations, and funding to VEOs.

2.7   Initial Model Results—Base Case Scenario

Initial results of a base case run of the model are given here. These results should be seen as illustrative rather than predictive and are meant to give insight into potential outcomes of the system under the assumptions of this particular model structure. Future work for this project will include further scenario analysis, as well as uncertainty quantification and assessment of the resulting outcomes.

The results of this scenario are driven by an invasion of the diaspora's home country. This invasion begins 12 months into the 10 year time horizon and lasts for two years. Because of this invasion, nationalism throughout the diaspora communities and the home country community increases, leading some of the people in each population to increase their support of the VEO, which is seen as fighting against the invasion (Fig. 1). The VEO can also be seen as the most effective, or at least the most destructive, force against the invading force. This perception can last to some degree over the course of the invasion and beyond, especially if the VEO is seen as successful or the home country's military is perceived as incompetent. In this case, he more initially aligned with the VEO, the greater and longer the support will be for the VEO (Fig. 3).
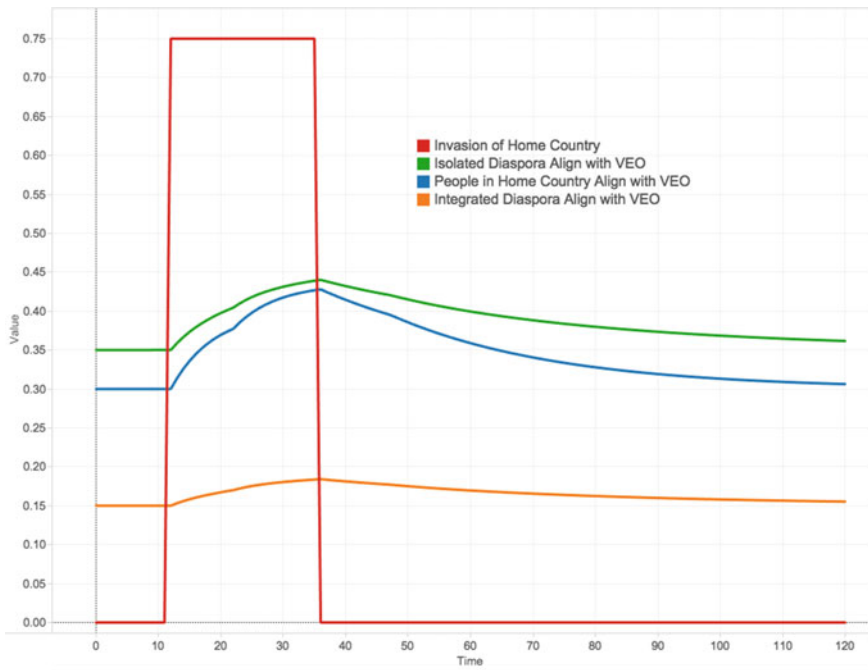

Fig. 3 Invasion of the country of interest and resulting alignment with the VEO among diaspora and home country communities
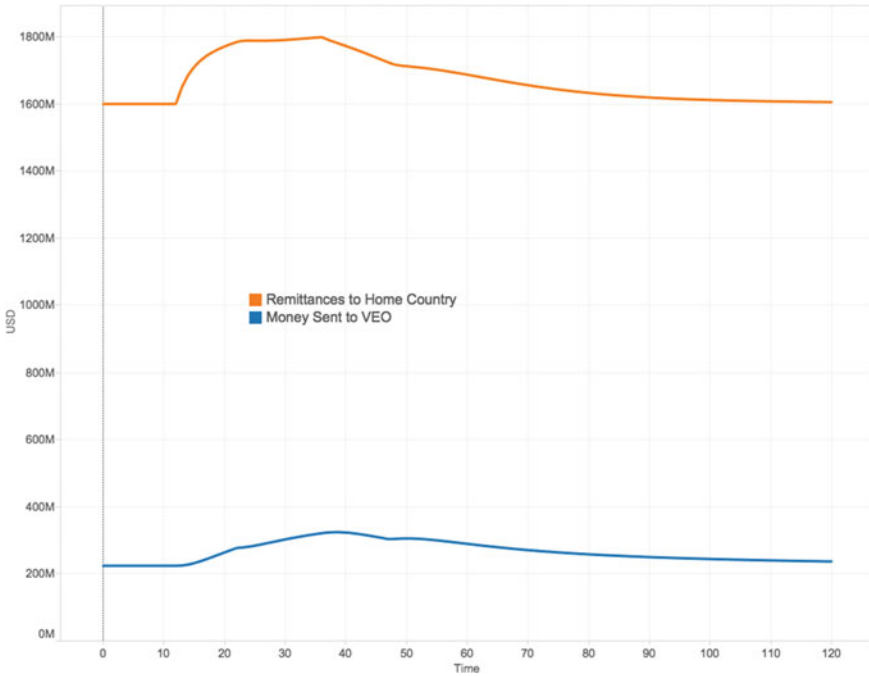
Fig. 4 Funding sent from diaspora to the home country

The invasion spurs the diaspora populations in Western countries to send more money to the home country (Fig. 4). Remittances grow over the time period of the invasion, as do funds sent specifically to the VEO. The diaspora populations see the VEO as helping to counter the invasion of the home country. Since sending funds is easier and safer than participating in a conflict, a rise in remittances may reflect a greater age range of individuals supporting the VEO than participating in the conflict.

Some of the people from each community will also choose to join the VEO. VEO recruiting is spurred by increased funding (Fig. 4) as well as by the perception that it is helping to counter the invasion. Nationalism, which also increases in response to the invasion, also encourages some to join the VEO. Figure 5 shows a stacked graph of VEO members coming from the home country, isolated diaspora in Western countries, and integrated diaspora in Western countries. Conditions in the home country and in Europe affect recruitment. The isolated diaspora community might tend to focus more than the integrated diaspora on events in the home country, and thus be more easily drawn into volunteering to participate in the conflict.
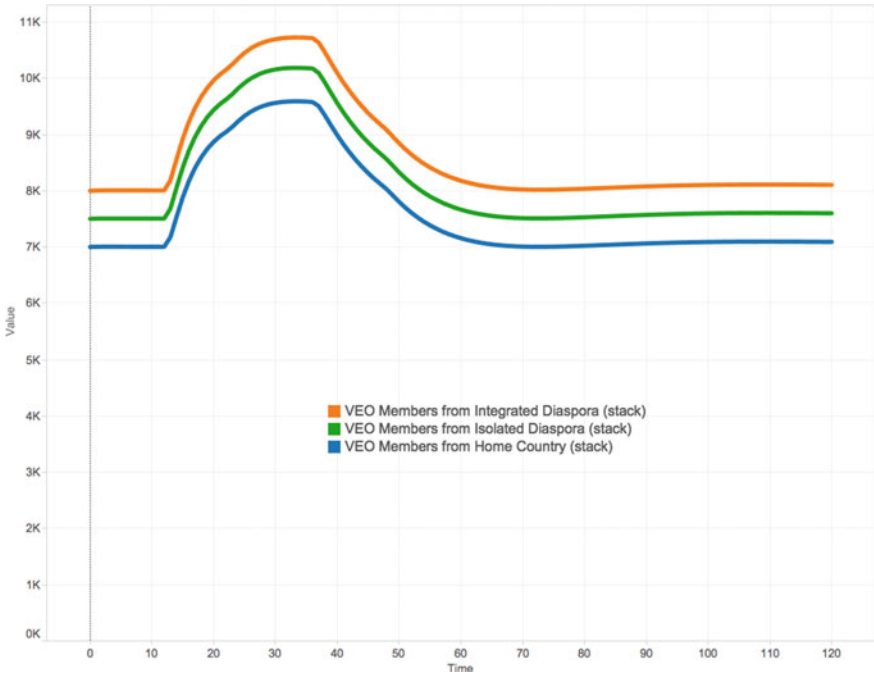
Fig. 5 VEO members from the home country and diaspora communities

Increased membership and funding cause public perception of the VEO's strength to grow during the invasion (Fig. 6, pink line). However, as this perception of strength increases, Western countries have more incentive to take action against the VEO's growing power in the home country. Once the perception of the VEO's strength reaches a threshold, Western countries take action against the VEO (Fig. 6, blue line). This decreases the VEO's overall strength and thus the perception of its strength among the general populations of the home country and Western countries (Fig. 6, red line). The overall perception of VEO strength is thus checked by Western action, and drops after the invasion ends as diaspora and home country support weaken, leading to lower levels of recruitment and funding for the VEO.

3   Conclusions

The intent of this effort is to investigate potential links between the actions of VEOs, people in the VEO's home country, and diaspora from that country living in the West. Our base case involves an initiating event focused on an invasion of the home country. Funding and recruitment to the VEO from diaspora populations are investigated, and Western intervention against the VEO is also included. We
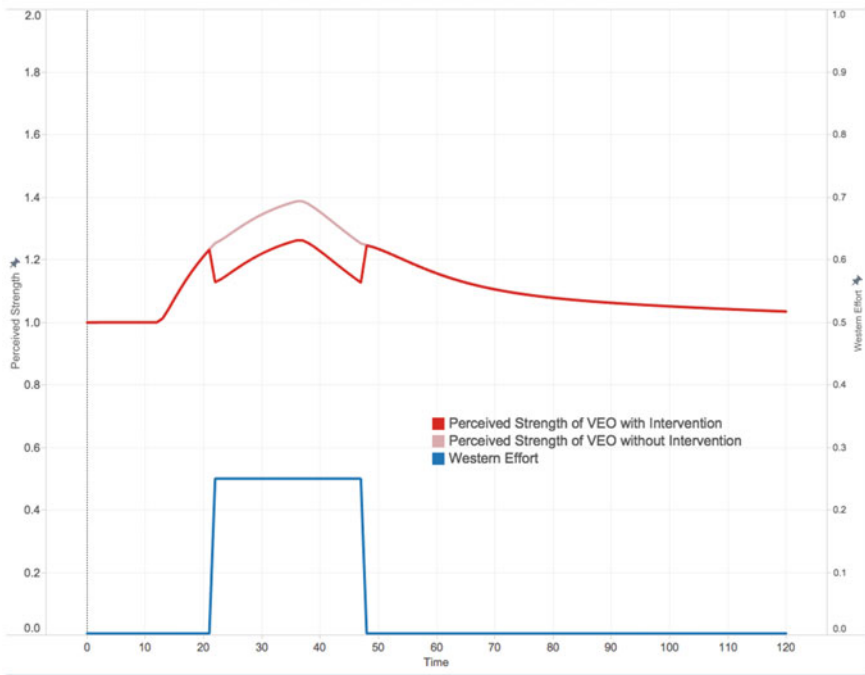
Fig. 6 Perception of VEO's strength and Western intervention

believe that with some alteration, this general model might apply to a variety of situations in which VEOs interact with home country and diaspora populations. This can give some insight into radicalization of diaspora populations, a topic which has recently been of great interest, especially considering recent influxes of migrants into Europe.

This is an initial study looking at diaspora populations and how they might be spurred to join or support VEOs. We plan to extend this by incorporating this model with two others. The first focuses on how VEOs might gain power among a population that is not ideologically inclined to support the VEO. The last model will focus on interactions between VEOs that want the support of diaspora and home country populations. We hope that by considering these three aspects of VEO interactions, we can gain insight into how these groups gain strength, membership, and money.

References

1. Council on Foreign Relations: CFR Backgrounders: Europe's Migration Crisis (2015). http://www.cfr.org/migration/europes-migration-crisis/p32874. Accessed 23 September 2015
2. Staub, E.: Reconciliation after genocide, mass killing, or intractable conflict: understanding the roots of violence, psychological recovery, and steps toward a general theory. Political Psychol. **27**(6), 867–894 (2006)
3. Eurostat: Migration and migrant population statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Migration_and_migrant_population_statistics. Accessed 1 March 2016
4. Pew Research Center: Refugee Surge Brings Youth to an Aging Europe (2015). http://www.pewresearch.org/fact-tank/2015/10/08/refugee-surge-brings-youth-to-an-aging-europe/. Accessed 8 October 2015
5. Politico: Europe's Man Problem: Migrants to Europe Skew Heavily Male—and How That's Dangerous. http://www.politico.com/magazine/story/2016/01/europe-refugees-migrant-crisis-men-213500. Accessed 5 January 2016
6. Lehman, S.: ISIS Lures 3 Teenage Girls: Reporter's Notebook. The New York Times. http://www.nytimes.com/2015/08/18/insider/isis-lures-3-teenage-girls-reporters-notebook.html. Accessed 18 August 2015
7. Shane, S.: From Minneapolis to ISIS: An American's Path to Jihad. The New York Times. http://www.nytimes.com/2015/03/22/world/middleeast/from-minneapolis-to-isis-an-americans-path-to-jihad.html. Accessed 21 March 2015
8. Sipus, M.: Support for al-Shabaab through the diaspora. Forced Migrat. Rev. (37), 29. Vancouver (2011)
9. Welsh, T.: Remittance Cutoffs Threaten Somalis. U.S. News & World Report. http://www.usnews.com/news/articles/2015/02/19/remittance-cutoffs-threaten-somalis. Accessed 19 February 2015
10. Dhami, S., Sheikh, A.: The family: predicament and promise. Caring for Muslim patients, pp. 43–56 (2000)
11. Rousseau, C., Hassan, G., Moreau, N., Thombs, B.D.: Perceived discrimination and its association with psychological distress among newly arrived immigrants before and after September 11, 2001. Am. J. Public Health **101**(5), 909–915 (2011)
12. Pew Research Center: Religion & Public Life. The World's Muslims: Religion, Politics and Society. http://www.pewforum.org/2013/04/30/the-worlds-muslims-religion-politics-society-overview. Accessed 30 April 2013
13. Hroub, K. ed.: Political Islam: Context Versus Ideology, vol. 8. Saqi (2012)
14. Ajzen, I.: The theory of planned behavior. Organ. Behav. Hum. Decis. Process. **50**, 179–211 (1991)
15. McFadden, D.: Qualitative response models. In: Hildenbrand, W. (ed.) Advances in Econometrics. Cambridge University Press, New York (1982)