

Measuring Effects and Success in Influence Operations: *Challenges, Limitations and Opportunities*

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Abstract

Little research in either the military or civilian sphere has attempted to assess the effects, degree of effects, and success of influence operations, particularly in hostile environments where it may prove both difficult and unreliable to conduct traditional interviews and opinion polls. Yet it has been asserted that the decisive effects of influence operations are apparent, and can therefore be measured. This report examines the challenges, limitations, and opportunities inherent to the measurement of the effects and success of influence operations on civilian populations in hostile environments. The report discusses the limitations of current methodologies and the opportunities associated with unobtrusive measures. This discussion is based on a systematic review of the literature in the fields of psychology, anthropology and sociology, and interviews conducted with pioneers of artificial intelligence technology as a conflict early-warning system. Artificial intelligence of social media could be used to assess the effectiveness and success of influence operations in hostile environments, especially when attitudes or behaviours may be socially sensitive and might not lend themselves well to participant self-assessment, or when pre-effect data collection capacities are limited and the establishment of a baseline is not possible.

Résumé

Peu de recherches dans les sphères militaire ou civile ont été menées pour tenter d'évaluer les effets, le degré des effets et le niveau de réussite des opérations d'influence, en particulier dans les milieux hostiles où il pourrait s'avérer difficile et peu concluant de réaliser des entrevues et des sondages d'opinion par des méthodes traditionnelles. Cependant, il a été affirmé que les effets décisifs des opérations d'influence étaient observables et, par le fait même, mesurables. Le présent rapport étudie les défis, les limites et les possibilités de l'évaluation des effets et du niveau de réussite des opérations d'influence effectuées auprès de populations civiles en milieux hostiles. Il traite également des limites des méthodes utilisées actuellement, ainsi que des possibilités liées aux mesures discrètes. La démarche se fonde sur un examen systématique de documents issus des domaines de la psychologie, de l'anthropologie et de la sociologie, ainsi que sur des entrevues menées auprès de pionniers des technologies de l'intelligence artificielle utilisées par exemple pour les systèmes d'alerte rapide lors de conflits. Il serait possible de recourir à l'intelligence artificielle des médias sociaux afin d'évaluer l'efficacité et le niveau de réussite des opérations d'influence en milieux hostiles, en particulier lorsque les attitudes ou les comportements sont délicats sur le plan social et ne se prêtent pas bien à l'auto-évaluation des participants, ou lorsque les capacités de collecte des données avant la tenue des opérations sont limitées et qu'il est impossible d'établir une base de référence.

Executive Summary

Little research in either the military or civilian sphere has attempted to assess the effects, degree of effects, and success of influence operations. As a result, there exists no agreed-upon evidence-based methodology to measure the effects and success of influence operations on civilian populations, particularly in hostile environments where it may prove both difficult and unreliable to conduct traditional interviews and opinion polls. Yet it has been asserted that the decisive effects of influence operations are apparent, and can therefore be measured.

This report examines the challenges, limitations, and opportunities inherent to the measurement of the effects and success of influence operations on civilian populations in hostile environments. Following a definition of the effects and success of influence operations, the report discusses the limitations of current methodologies, such as the Tactical Conflict Assessment Framework, and the opportunities associated with unobtrusive measures. This discussion is based on a systematic review of the literature in the fields of psychology, anthropology and sociology, and interviews conducted with pioneers of artificial intelligence technology as a conflict early-warning system.

The report concludes that artificial intelligence of social media could be used to assess the effectiveness and success of influence operations on civilian populations in hostile environments, especially when attitudes or behaviours may be socially sensitive and might not lend themselves well to participant self-assessment, or when pre-effect data collection capacities are limited and the establishment of a baseline is not possible. Digital information analysis is likely to gain relevance in the measurement of the effects and success of influence operations given rapid rates of democratization of Internet-based communications.

Sommaire

Mesurer les effets et la réussite des opérations d'influence

Peu de recherches dans les sphères militaire ou civile ont été menées pour tenter d'évaluer les effets, le degré des effets et le niveau de réussite des opérations d'influence. C'est pourquoi il n'existe pas de méthodologie convenue fondée sur des preuves pour mesurer les effets et la réussite des opérations d'influence, en particulier dans les milieux hostiles où il pourrait s'avérer difficile et peu concluant de réaliser des entrevues et des sondages d'opinion par des méthodes traditionnelles. Cependant, il a été affirmé que les effets décisifs des opérations d'influence sont observables et, par le fait même, mesurables.

Le présent rapport étudie les défis, les limites et les possibilités de l'évaluation des effets et du niveau de réussite des opérations d'influence effectuées auprès de populations civiles en milieux hostiles. En se fondant sur une définition des effets et de la réussite des opérations d'influence, le rapport traite des limites des méthodes utilisées actuellement, comme le « Tactical Conflict Assessment Framework », ainsi que des possibilités liées aux mesures discrètes. La démarche se fonde sur un examen systématique de documents issus des domaines de la psychologie, de l'anthropologie et de la sociologie, ainsi que sur des entrevues menées auprès de pionniers des technologies de l'intelligence artificielle utilisées par exemple pour des systèmes d'alerte rapide lors de conflits.

Le rapport conclut qu'il serait possible de recourir à l'intelligence artificielle des médias sociaux afin d'évaluer l'efficacité et le niveau de réussite des opérations d'influence en milieux hostiles, en particulier lorsque les attitudes ou les comportements sociaux sont délicats sur le plan social et ne se prêtent pas bien à l'auto-évaluation des participants, ou lorsque les capacités de collecte des données avant la tenue des opérations sont limitées et qu'il est impossible d'établir une base de référence. Il est fort probable que le recours à l'analyse des informations numériques pour mesurer les effets et la réussite des opérations d'influence s'intensifie en raison de la démocratisation rapide des communications par Internet.

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Introduction: Current Assessment Capabilities

Several military strategists¹ have argued that modern warfare has evolved from a battle for physical terrain to a battle for ‘hearts and minds’.² Whereas the center of gravity³ in conventional warfare was seen as the will of the enemy’s government and military forces⁴, the centre of gravity in modern conflicts has shifted “to the perceptions of populations. Victory will be defined more in terms of capturing the psycho-cultural rather than the geographical highground”⁵. The information environment, and influence operations more specifically, have therefore gained prominence on the modern battlefield.

As a result of this shift, measuring the success of military campaigns is now an inherently more difficult process. ‘Success’ used to be measured by drawing new lines on maps to demonstrate newly-acquired territory and, in the case of conflicts of attrition, by citing asymmetrical body counts. Measuring ‘hearts and minds’ won in the course of influence operations, on the other hand, is a multifaceted and convoluted enterprise; in fact, “useful measures of progress are so elusive that, when asked [in 2005] how, if he

¹ Boyd, C. D. “Army IO is PSYOP: Influencing More with Less. *Military Review*. (Vol. 87, No. 3, May-June 2007); Claessen, E. “Discouraging Hearts and Minds: Democracies and Insurgencies.” *Military Review*. (Vol. 87, No. 3, May-June 2007); Darley, W. “The Missing Component of U.S. Strategic Communications.” *Joint Force Quarterly*. (Vol. 47, 2007); King, Sarah B. “Military Social Influence in the Global Information Environment: A Civilian Primer.” *Analyses of Social Issues and Public Policy*. (Vol. 00, No. 00, 2010); Murphy, D. “Attack or Defend? Levering Information and Balancing Risk in Cyberspace.” *Military Review*. (May-June 2010); Scales, R. “Clausewitz and World War IV.” *Armed Forces Journal*. (Vol. 16, No. 24, July 2006).

² King, Sarah B. “Military Social Influence in the Global Information Environment.” p.1.

³ The center of gravity in warfare is a concept introduced by Clausewitz, which refers to “the hub of all power and movement, on which everything depends.” Clausewitz, C. *On War*. in Howard, M. and Paret, P. (eds. and trans.). (Princeton, NJ: Princeton University Press, 1976), p. 485.

⁴ Krepinevich, A. “Are We Winning In Iraq?” (Testimony to the United States House of Representatives Committee on Armed Forces, Center for Strategic and Budgetary Assessments, March 17, 2005). p.4.

⁵ Scales, R. “Clausewitz and World War IV.” *Armed Forces Journal*. (Vol. 16, No. 24, July 2006). p.18. <http://www.strategicstudiesinstitute.army.mil/Pubs/display.cfm?PubID=642>.

returned in six months, he would know whether progress was being made [in the counterinsurgency], General Fraser said he would ‘ask some Afghans’⁶, as it will be the attitudes, perspectives, perceptions, commitments and behaviours of the population that will ultimately determine whether the operation has been successful.

Yet General Fraser did not elaborate on *which* Afghans to ask, *what* to ask, and *how* to ask it. Little research in either the military or civilian sphere has attempted to assess the effects, degree of effects, and success of influence operations. As a result, there exists no agreed-upon evidence-based methodology to measure the effects and success of influence operations, particularly in hostile environments where it may prove both difficult and unreliable to conduct traditional interviews and opinion polls. Looking at American influence operations in Iraq as an example, it is evident that a consistent methodology is not being applied to set and analyze measures of effectiveness: while “some U.S. units understand and use the concepts of setting objectives, developing themes, and setting measures of effectiveness... others do not understand the process and therefore are just conducting operations without any measure of success or failure.”⁷ In instances where there are attempts at measuring the effects of influence operations, such measurements are, at best, “difficult to ascertain”⁸ given the multiple variables at play.⁹ As a result, “success in most of the domains of information operations is difficult to

⁶ Graham, B. “Enemy Body Counts Revived: U.S is Citing Tolls to Show Success in Iraq.” *Washington Post*. (Washington, October 24, 2005).

⁷ Center for Army Lessons Learned (CALL). “On Point: The United States Army in *Iraqi Freedom*.” (Fort Leavenworth, August 2004). p.5.

⁸ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. (Washington, DC: National Defense University Press, 2005). p.57. <http://www.fas.org/irp/eprint/lamb.pdf>

⁹ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*; Seese, G. And Smith, P. “Measuring PSYOP Effectiveness.” *Special Warfare*. (Vol. 21, No.6, November-December 2008).

measure.”¹⁰ A systematic ‘culture of measurement’ is also not in place. During interviews conducted as part of a lessons-learned exercise on psychological operations (PSYOP), it was noted that requesting financial resources to conduct a survey in a military headquarters is “considered unusual”¹¹, and that “PSYOP forces lack the training to do polling systematically and professionally so that effects can be more reliably measured”¹².

Despite these limitations, it has been asserted that the decisive effects of influence operations are apparent¹³, and can therefore be measured. These measures tend to be qualitative in nature, and have confirmed “desired effects.”¹⁴ PSYOP in Afghanistan, for example, are reported to have resulted in high rates of Taliban troop surrender during the initial phases of invasion¹⁵ and in a high rate of civilian non-interference both during and in the immediate aftermath of combat, thereby minimizing civilian casualties¹⁶. These oft-cited variables, however, are relatively easy to measure and do not provide a complete narrative of the effects and outcomes of influence operations. This is particularly the case for measures of effectiveness of the perceptions, attitudes and behaviours of civilian populations, since these measures are “far more questionable—and even harder to

¹⁰ Fontenot, Gregory, et al. “On Point: The United States Army in Operation Iraqi Freedom.” (First Naval Institute Press, 2005). p.419

¹¹ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.190.

¹² Idem.

¹³ Maiers, Mark W. and Rahn, Timothy L. “Information Operations and Millennium Challenge.” *Joint Force Quarterly*. (No. 35, 2004). p.83.

¹⁴ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.27.

¹⁵ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.58.

¹⁶ Dunbar, R. “Achieving Irreversible Momentum.” *IOSPHERE, Journal of the Joint Information Operations Centre*. (Winter 2009); Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.59.

measure”¹⁷— than measures of effectiveness on enemy troops, which are facilitated by the possibility of conducting interviews with prisoners of war. The indicator of civilian compliance during combat operations also reveals more about the will of the population for immediate survival, rather than the internalization of messages disseminated over the course of influence operations. While the effects and success of influence operations on populations can be measured, the selection of indicators, as well as the collection and analysis of data, so far has been “inadequate”¹⁸.

This report will inject social influence in modern military affairs by looking at the challenges, limitations, and opportunities inherent to the measurement of the effects and success of influence operations on civilian populations in hostile environments. Following a definition of the effects and success of influence operations, this report will discuss the limitations of current methodologies, and will discuss the opportunities associated with unobtrusive measures.

Defining Influence Operations Effects and Success

The ultimate goal of influence operations is to manoeuvre a shift in enemy decisions and population opinions in ways favourable to national objectives. A shift occurs when one or several effects, that is “the power to bring about a result”¹⁹ of the

¹⁷ King, Sarah B. “Military Social Influence in the Global Information Environment.” p.7. See also: Jones, J., Kuehl, D., Burgess, D. and Rochte, R. “Strategic Communication and the Combatant Commander.” *Joint Force Quarterly*. (Vol. 55, No. 4, 2009); Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*; Shanker, T. and Hertling, M. “The Military-media Relationship: A Dysfunctional Marriage?” *Military Review*. (Vol. 89, No. 5, September-October 2009).

¹⁸ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.6.

¹⁹ Mann, Edward C., Endersby, Gary, and Searle, Thomas R. “Thinking Effects: Effects-based Methodology for Joint Operations.” *CADRE Paper No.15*. (Maxwell Air Force Base, AL: Air University Press, October 2002). p. 30.

persuasion, are produced using either kinetic or non-kinetic actions, or a combination of both. For an effect to occur there must be a change in the population's decision cycle or the manifestation of a differing behaviour. In other words, this shift must lead to measurable effects that are either attitudinal (i.e. awareness, perspective, perception, commitment) and/or behavioural in nature. Measures of effectiveness of influence operations seek to qualify and quantify if a message intended to influence was perceived and then evaluated by the target audience, if it affected the target's thinking, and if it led to a behavioural consequence. Examples of effects include, but are not limited to, information denial and delay, psycho-social attitude shift, prolonged decision-making, and ultimately, change in target audience behaviour.²⁰

There are different levels and degrees of effects. Levels of effects are classified along first, second and third order effects:

[F]irst-order effects are associated with the physical dimension of the information environment, while second- and third-order effects are associated with the information environment's information and cognitive dimensions. A first-order effect is a direct effect, a result of actions with no intervening effect or mechanism between the act and outcome. Such an effect can trigger additional outcomes, which are indirect (second- and third-order) effects.²¹

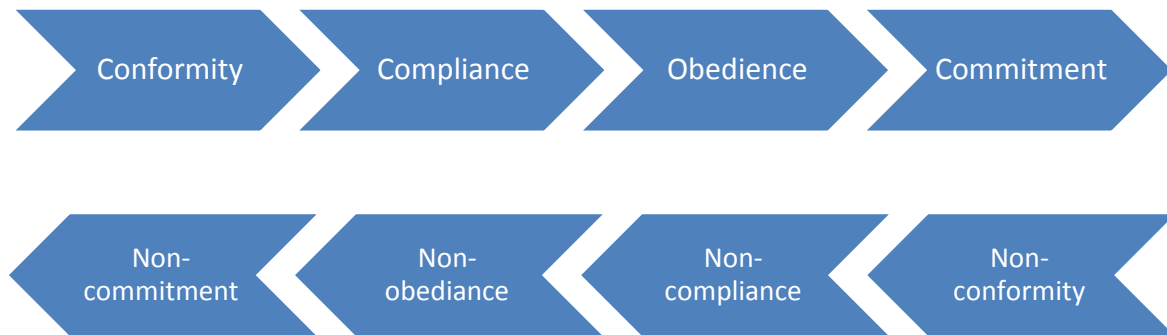
Measures of effectiveness must therefore gauge first, second and third order effects, as unanticipated reactions to influence operations could arise from first order effects, and adversely impact the population's attitude and behaviour. Degrees of social influence effects are situated on a continuum, ranging from conformity, compliance, and obedience to commitment, and can either be positive (i.e., conformity) or negative (i.e., non-

²⁰ Staker, R.J. "Military Information Operations Analysis Using Influence Diagrams and Coloured Petri Nets."(DSTO Electronics and Surveillance Research Laboratory, Department of Defense, Salisbury, Australia, 1999). p.iii. <http://dSPACE.dsto.defence.gov.au/dSPACE/bitstream/1947/4354/1/DSTO-TR-0914.pdf>

²¹ Emery, Norman E. "Understanding the Role of People, Capabilities, and Effects." *Military Review*. (November-December 2008). p.27.

conformity) (see Figure 1). Measures of effectiveness should, therefore, have a level of sophistication that enables an assessment of the degree and direction of the effect.

Figure 1: Continuum of Degrees and Directions of Social Effects



Measuring effects and measuring success are two different processes. Success occurs when effects align with the commander’s objectives. An effect, on the other hand, can be in support of, or detrimental to, the commander’s objectives. An effect could also have been induced, but not to a sufficient degree to meet the commander’s objectives. Measuring success, therefore, involves measuring the sum of effects – including first, second and third order effects, as well as the degree and direction of effects – to determine whether the message was perceived, assessed, and assimilated by the target audience so as to meet the commander’s objectives. The success of influence operations in irregular warfare can also only be evaluated over a period of time, especially in view of the fact that insurgencies historically tend to between 9 to 12 years²². Indicators of success, therefore, ought to focus on trends in the population’s attitudes towards and

²² Emery, Norman E. “Understanding the Role of People, Capabilities, and Effects.” p. 31.

behaviour during the war, as opposed to snapshots at a particular moment²³ — these ‘snapshots’, however, are appropriate for measuring effects. The commander’s objectives and target audiences must also be well-defined to allow for a proper assessment of success; “without stepping back to examine the fundamental premises of what success means in irregular warfare, decision makers cannot have confidence in their methodologies or results”²⁴. These objectives should, therefore, be specific, measurable, attainable, realistic, timely and tangible, by specifying the target audience, what is to be accomplished, for what purpose, in which location and within which timeframe, and by being associated with a set of criteria that will be used to assess progress and recognize when the overarching goal has been attained.

Measures: Why Polls and Surveys Alone Are Insufficient

Qualitative methods that have been employed to assess the effects and success of information operations include direct observation, polling, surveys, and interviews with a sample of the population²⁵:

[The information is collected] in face-to-face meetings that take place during patrols; focus groups with locals to clarify their views and formulate an understanding of the underlying structure of their attitudes, policy preferences, and behaviors; and survey research that can facilitate the creation of quantitative baselines and trend analyses of key attitudes or that can predict attitude change based on a knowledge of underlying

²³ Krepinevich, A., “Are We Winning In Iraq?”, Testimony to the United States House of Representatives Committee on Armed Forces, Center for Strategic and Budgetary Assessments, March 17, 2005, p.3.

²⁴ Clancy, James and Crosset, Chuck. “Measuring Effectiveness in Irregular Warfare.” *Parameters*. (Vol. 37, 2007). p.99.

²⁵ Lamb, C. *Review of Psychological Lessons Learned from Recent Experience*. p.29.

attitude structures and, thereby, inform the development of appropriately targeted and tailored influence campaigns and messages.²⁶

These methods, particularly attitude surveys, are seen as an “efficient way”²⁷ to assess the effects and success of influence messages on target audiences. As such, the development, administration and analysis of survey instruments are seen as key in the measurement of effectiveness and success of influence operations.²⁸ When analysts allude to or identify limitations in these data collection methods, they tend to concentrate on the physical peril inherent to conducting surveys in dangerous environments,²⁹ and emphasize that “there appear to be few alternatives [to surveys and polling] for developing the sort of detailed understanding of attitudes that is necessary for effective influence operations”³⁰.

I hypothesize, however, that these data collection methods do not generate accurate or reliable measures of effectiveness or success in hostile environments. First, analysts are reported to be “overcome by the sheer volume of raw data”³¹ collected in the context of recent operations; as a result, “there is little foundational understanding of what success means in irregular warfare that will assist analysts in interpreting operational effectiveness.”³² In the context of influence operations, the absence of an accepted analytical framework often renders the captured data meaningless. Second, these methods center on participant self-assessment that usually requires the data collector (survey

²⁶Larson, Eric V. et al. *Foundations of Effective Influence Operations: A Framework for Enhancing Army Capabilities*. (RAND Corporation: Santa Monica, 2006). p.67.

²⁷ Ibid. p.70.

²⁸ Ibid p.77-78.

²⁹Ibid. p.67.

³⁰Idem.

³¹ Clancy, James and Crosset, Chuck. “Measuring Effectiveness in Irregular Warfare.” p.88.

³² Idem.

administrator) be physically present; and, as such, introduce “a foreign element into the social setting they would describe.”³³ The presence of a civil-military relations officer on patrol discussing with village elders or an indigenous civilian researcher hired to conduct a survey can be resented by respondents, who can be offended by the questions asked or irritated at being asked to participate in a survey. Third, the physical presence of the surveyor also interrupts the natural stream of behaviour of the respondents; and, as such, not only measures but also creates attitudes (second and third order effects). Classical experiments by Schanck and Goodman conducted in 1939³⁴, and by Crespi in 1948³⁵, demonstrate that a survey “forces upon the subject a role-defining decision”³⁶, and may compel the respondent to formulate an opinion or attitude when one might not have existed before.³⁷ Fourth, and most importantly, these data collection methods assess attitudes and behaviours that respondents may not be willing to report directly, especially in hostile environments where expressing support for or opposition to a leader, a government, an ideology, a military operation or an armed force could have life or death consequences for the respondents. For example, participants in a survey conducted by the Canadian Forces with residents of Kandahar in 2010 reported feeling that the security situation was improving – yet the International Committee of the Red Cross reported

³³ Webb, Eugene J. et al. *Unobtrusive Measures: Revised Edition*. (Sage Publications: Thousand Oaks, 2000). p.1.

³⁴ Schanck, R. L., and Goodman, C. “Reactions to Propaganda on Both Sides of a Controversial Issue.” *Public Opinion Quarterly*. (Vol. 3, 1939).

³⁵ Crespi, Leo P. “The Interview Effect in Polling.” *Public Opinion Quarterly*. (Vol. 12, No. 1, 1948).

³⁶ Webb, Eugene J. et al. *Unobtrusive Measures: Revised Edition*. (Sage Publications: Thousand Oaks, 2000). p.1.

³⁷ See also: Mercatoris, M. and and Craighead, W. E. “Effects of non-participant Observation on Teacher and Pupil Classroom Behavior.” *Journal of Educational Psychology*. (Vol. 66, 1974); Surratt, P. R., Ulrich, R. E., and Hawkins, R. O. “An Elementary Student as a Behavioral Engineer.” *Journal of Applied Behavior Analysis*. (Vol. 2, 1969); White, G. D. “The Effects of Observer Presence on the Activity Level of Families.” *Journal of Applied Behavior Analysis*. (Vol. 10, 1977).

(over the same time period) the number of civilian war casualties in the region was drastically increasing³⁸, internal United Nations residual risk accessibility maps showed a marked deterioration of the security situation over the same period, and a survey released by the Asia Foundation reported that 61% of Afghans in the South East feared for their personal safety³⁹. “In the context of a military campaign, there are many challenges to ensuring that the sorts of attitudes that are presented in focus groups and surveys are sincere ones”⁴⁰. Surveying a population in a hostile environment on socially sensitive issues may not yield an accurate attitudinal measure.

Another example of the fallibility of surveys as a data collection method to measure effectiveness is the Tactical Conflict Assessment Framework (TCAF) developed by USAID and used by the British 52 Brigade in Helmand Province. The TCAF questionnaire was used at the tactical level to establish a baseline and measure the impact of activities on changes in local perceptions of the causes of instability. Using a diagnostic methodology, patrols asked locals a set of four questions to identify what issues most concerned them⁴¹; follow-up questionnaires were then administered to measure the effectiveness of these activities. While “a trial of TCAF in Lashkar Gah appeared to show very positive results in terms of gathering intelligence to target non-

³⁸ What’s more, this number is likely to be under-representative given that the survey team did not travel to a number of sampling points that were inaccessible due to security reasons. “Kandahar, Afghanistan, Security ‘Deteriorating’: ICRC.” (United Nations Radio transcript, December 10, 2010). <http://www.unmultimedia.org/radio/english/detail/103585.html>

³⁹ Tariq, Mohammad Osman, Ayoubi, Najla, and Haqbeen, Fazel Rabi. *Afghanistan in 2010: A Survey of the Afghan People*. (Asia Foundation, November 2010). p.4.

⁴⁰ Mann, Edward C., Endersby, Gary, and Searle, Thomas R. “Thinking Effects.” p.66.

⁴¹ These questions are: Q1 – Have there been changes in the village population and why? Q2 – What are the most important problems facing the village? – Q3 – Who do you believe can solve your problems? Q4 – What should be done first? Farrell, Theo. “Improving in War: Military Adaptation and the British in Helmand Province, Afghanistan, 2006-2009.” *Journal of Strategic Studies*. (Vol. 33, No. 4, 2010). p.579.

kinetic activities... this may have created unrealistic expectations in the task force headquarters, and it would appear that TCAF was rolled out too quickly across Helmand, and especially into districts where the environment was not conducive to regular interaction with non-hostile local populations”⁴². Other methodological issues surrounding the implementation of TCAF include the reliance on convenience sampling, significant amounts of variation in the selection of participants, the instructions given to soldiers on how to carry-out interviews, and in the conduct of interviews.⁴³ The high-profile nature of the interviews, which took place in public forums, also had the potential to add response bias, particularly given that

[I]t is often said that in Afghanistan people will tend to tell you what they think you want to hear, rather than voicing their true opinion on a matter. This tendency might be exacerbated when... a question such as 'Who do you believe can solve your problems?' is asked by an armed ISAF soldier; the respondent might feel an even greater pressure to respond in a socially desirable manner; thus the answers of 'government' or 'ISAF' might be given even though it may not be their true opinion⁴⁴.

More importantly, the survey, developed as a tool to measure the impact of development programming in conflict-affected environments, serves as a better measure of stability operations than of influence operations.⁴⁵ As a result, the original TCAF was discontinued as a survey instrument by the British military in 2009.

⁴² Farrell, Theo. “Improving in War: Military Adaptation and the British in Helmand Province, Afghanistan, 2006-2009.” *Journal of Strategic Studies*. (Vol. 33, No. 4, 2010). p.580.

⁴³ Wilson, David and Conway, Gareth E. “The Tactical Conflict Assessment Framework: A Short-lived Panacea.” *The Rusi Journal*. (Vol. 154, No. 1, February 2009). p.10.

⁴⁴ Wilson, David and Conway, Gareth E. “The Tactical Conflict Assessment Framework: A Short-lived Panacea.” *The Rusi Journal*. (Vol. 154, No. 1, February 2009). p.10.

⁴⁵ *Ibid.* p.13.

Unobtrusive Measures

Empirical evidence from the field of social science indicates that unobtrusive measures “produce more valid attitudinal estimates for issues that are socially sensitive in nature”⁴⁶ than participant self-assessment. Unobtrusive measures were first developed by Webb, Campbell, Schwartz and Sechrest in 1966 and involve methodologies that do not require direct elicitation of data from the research subjects. These measures are described as “nonreactive methods of gathering data”⁴⁷ that do not call for the researcher to intrude in the research context; as such, respondents are neither aware of the existence of the research, its purpose, nor that they are being studied. These measures overcome a variety of pressures likely to distort responses in direct surveys and self-report procedures for assessing attitudes, namely: “evaluation apprehension, demand characteristics, social approval, the ‘guinea pig’ effect, response sets, and investigator characteristics effects.”⁴⁸ Unobtrusive measures have been shown to reduce reactivity, enhance reliability of results, and, when relying on archival or trace evidence, allow for study over an extended period of time.

Unobtrusive measures can rely on simple observation, disguised observation (also known as indirect measure), erosion measures (signs and degree of use yields the measure) accretion measures (research evidence is the deposit of materials), as well as

⁴⁶ Divdio, John F. and Fazio, Russell H. “New Technologies for the Direct and Indirect Assessment of Attitudes.” In *Questions About Questions: Inquiries into the Cognitive Bases of Surveys*. Judith M. Tanur (ed.). (Russell Sage Foundation: New York, 1994). p.228.

⁴⁷ Hagan, Frank E. *Essentials of Research Methods in Criminal Justice and Criminology*. (Prentice Hall, 2003). p.234.

⁴⁸ Cialdini, Robert B. and Baumann, Donald J. “Littering: A New Unobtrusive Measure of Attitude.” *Social Psychology Quarterly*. (Vol. 44, No. 3, 1981). p.254.

content-analysis of archives, speeches, mass-media. In certain instances, more unusual data sources have been used for content-analysis, such as graffiti, litter and obituaries. The greatest impediments to the use of unobtrusive data are ethical issues, namely concerns over the privacy and non-consent of research subjects, as well as the difficulty of obtaining non-archival unobtrusive data.⁴⁹

Applying Unobtrusive Measures to Hostile Environments

Yet new technology could enable the application of unobtrusive methods to measure the effects of influence operations in hostile environments. Increased sophistication in artificial intelligence, and the democratization of digital media, are ushering in a new era for researchers through the rapid increase of digital unobtrusive data sources. Online communications create ‘digital footprints’, which constitute unobtrusive data that is already transcribed and can be easily accessed and analysed.⁵⁰ These footprints are being used in the private sector by marketers to analyze attitudinal and behavioural trends through a content-analysis of the substance, process, and structure of online communication networks. Artificial intelligence is capable of ‘reading’ all forms of digital text media publicly available on the Internet, which allows for the monitoring and analysis of the content of social media networks, such as Facebook, Twitter, and Bebo,

⁴⁹ See: Kazdin, Alan E. “Unobtrusive Measures in Behavioral Assessment.” *Applied Behavioral Analysis*. (Vol. 12, No. 4, Winter 1979). p.721; Sechrest, Lee and Phillips, Melinda. “Unobtrusive Measures: An Overview.” In *Unobtrusive Measurement Today*. Lee Sechrest (ed.). (Jossey-Bass Inc. Publishers: San Francisco, 1979). p.13.

⁵⁰ Arosio, Laura. “Personal Documents on the Internet: What’s New and What’s Old.” *Journal of Comparative Research in Anthropology and Sociology*. (Vol. 1, No. 2, 2010). p.35.

newsgroups, online forums, weblogs, micro-blogs, and other Web 2.0 social media services around the world. Keywords, phrases, and strings are analyzed by the artificial intelligence system, which organizes and categorizes the data according to perceptions, attitudes, and behaviours, as well as an aggregate profile of the research subjects, such as gender, age, ethnicity, geographic location, and political affiliation. The attitudinal and behavioural measures generated from digital samples are representative of the larger population within a geographic area. In a study published in 1997 (when Internet penetration rates were relatively low), Smith and Leigh compared “Internet and non-Internet samples on several demographic variables. They found that the samples did not differ in terms of sexual orientation, marital status, ethnicity, education, and religiosity, but that they did differ in terms of age and sex. While sex and age are important variables, if anything these results appear to support the advantage of Internet over traditional samples since the Internet sample contained a wider age range”⁵¹ and a greater number of research subjects.

The categorization of data according to perceptions, attitudes, and behaviours, as well as an aggregate profile of the research subjects, allows analysts to measure change in attitudinal and behavioural variables, and to compare these changes amongst various sophisticated subject profiles (i.e., males in x age category, living in y area, with z level of education). Such content-analysis could also enable analysts to measure whether changes in attitudes and behaviours are a result of normative or informational influence. “The first, normative influence, is based on the desire to conform to the expectations of

⁵¹ Hewson, Claire et al. *Internet Research Methods : A Practical Guide for the Social and Behavioural Sciences*. (SAGE Publications: London, 2003). p.27.

others. Judgment shifts are assumed to result from exposure to others' choice preferences and from subsequent conformity to the norms that are implicit or explicit in these preferences. The second, informational influence, is based on the acceptance of information from others as evidence about reality.”⁵² Studies have shown that informational influence produces more frequent and stronger shifts than does normative influence; analysts could, therefore, have an indication of the strength of the attitudinal or behavioural shift.⁵³ Such information would enable analysts tasked with measuring the effects of influence operation to assess the continuum of degree of effects, establishing whether behaviours and attitudes are caused by conformity, compliance, obedience, or commitment.

The greatest potential of digital information – apart from the unobtrusiveness of the data collection method and the large number of research subjects – lies in its archival capabilities; data tends to be stored on servers for decades, allowing for the collection and analysis of data produced in the past. The ease of access to this archived information enables analysts to establish baselines and create trend analyses. This capability is particularly pertinent to information operations in hostile environments where it is difficult to ascertain a baseline if pre-effect data collection capacities are limited.

Digital information analysis is likely to gain relevance in the measurement of the effects and success of influence operations given rapid rates of democratization of

⁵² Kaplan, Martin F. and Miller, Charles E. “Group Decision Making and Normative Versus Informational Influence: Effects of Type of Issue and Assigned Decision Rule.” *Journal of Personality and Social Psychology*. (Vol. 53, No. 2, 1987). p.306.

⁵³ Burnstein, E., & Santis, K. “Attitude Polarization in Groups.” In R. E. Petty, T. M. Ostrom and T. C. Brock (Eds.). *Cognitive Responses in Persuasion* (Hillsdale, NJ: Erlbaum, 1981); Kaplan, M. E., & Miller, C. E. “Group Discussion and Judgment.” In P. Paulus (Ed.). *Basic Group Processes*. (New York: Springer-Verlag, 1983).

Internet-based communications. “Technology use rates are considerably higher now than they were just a few years ago for almost every country in the world”⁵⁴, including failed and fragile states. The number of Internet users in the world doubled between 2005 and 2010. In 2010, the number of Internet users surpassed the 2 billion mark – 1.6 billion of them even had access to the Internet at home in 2010 (up from 1.4 billion in 2009), including 1.2 billion in developing countries.⁵⁵ Indeed, while in 2005 the majority of Internet users were in the developed world, by 2010 developing countries increasing their share of Internet subscriptions to 57 percent⁵⁶ of the world’s connections (see Graph 1). To put these numbers in perspective, while the International Telecommunications Union⁵⁷ reports that only 3.4% of the population of Afghanistan had access to the Internet in 2010, Internet subscriber penetration rates are high, with 33 percent increase annually – and these rates are expected to continue to increase exponentially given new investments in Afghan telecommunications infrastructure. Other countries of interest also have high Internet penetration rate: Iran at 34.9 percent, Haiti at 11.3 percent, Sudan at 10.0 percent, and Lybia at 5.5 percent.⁵⁸ Examples from the realm of development indicate an appetite on the part of villagers in the developing world to use the Internet⁵⁹.

⁵⁴ Chinn, Menzie D. and Fairlie, Robert W. “ICT Use in the Developing World: An Analysis of Differences in Computer and Internet Penetration.” *Review of International Economics*. (Vol. 18, No. 1, June 2006). p.155.

⁵⁵ “ICT Facts and Figures: The World in 2010 – The Rise of 3G.” (International Telecommunication Union, Geneva, 2010). p.5. <http://www.itu.int/ITU-D/ict/material/FactsFigures2010.pdf>

⁵⁶ Ibid. p.4.

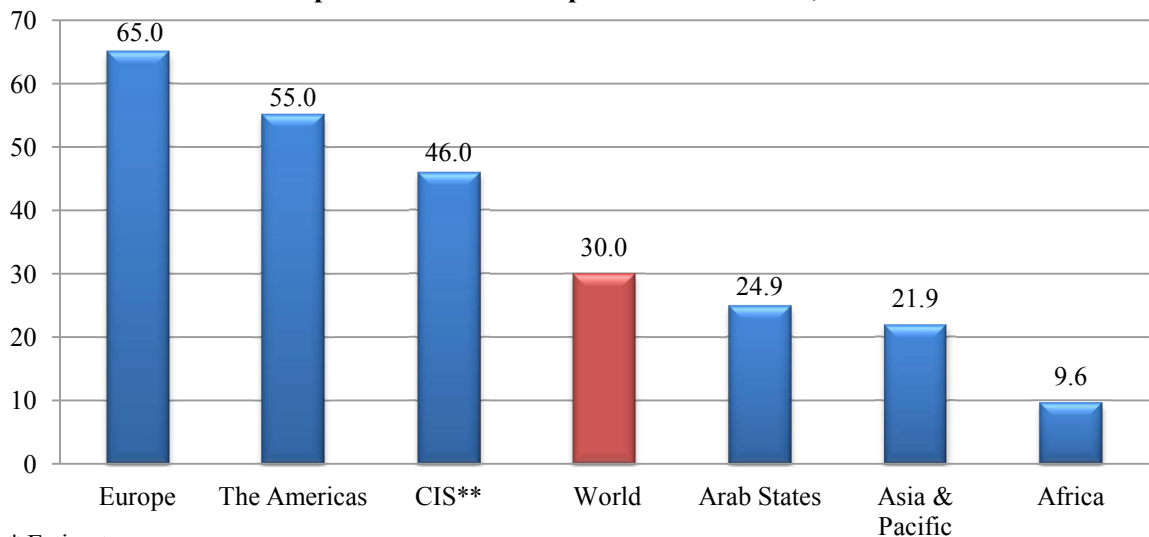
⁵⁷ The International Telecommunications Union (ITU) is the leading United Nations agency for information and communication technology issues, and the global focal point for governments and the private sector in developing networks and services.

⁵⁸ ITU

⁵⁹ Tan-Torres Edejer, Tessa. “Disseminating Health Information in Developing Countries: The Role of the Internet.” *British Medical Journal*. (Vol. 321, No. 797, September 2000).

The high penetration rates of satellite television and mobile telephones⁶⁰ in the developing world also demonstrate that new technologies are being adopted and increasingly used; while accessing the Internet requires a greater capital investment, the exponential increase in Internet penetration rates suggests that unobtrusive measures collected through artificial intelligence could be increasingly used to measure the effects of influence operations in hostile environments.

Graph 1: Internet users per 100 inhabitants, 2010*



* Estimate

** Commonwealth of Independent States

Regions are based on the ITU BDT Regions, see: <http://www.itu.int/ITU-D/ict/definitions/regions/index.html>

Source: ITU World Telecommunication /ICT Indicators database

Conclusion

This report injected social influence in modern military affairs by looking at the challenges, limitations, and opportunities inherent to the measurement of the effects and

⁶⁰ Ghashghai, Elham and Lewis, Rosalind. "Issues Affecting Internet Use in Aghanistan and Developing Countries in the Middle East." Rand Issue Paper. (2002).

success of influence operations on civilian populations in hostile environments. Measuring the success of influence operations in unconventional warfare, where the center of gravity is the population, as opposed to governments or the enemy's military forces, is an intricate matter. Whereas during the Cold War analysts measure the success of influence operations by looking at policy decisions,⁶¹ analysts must now analyse data at a micro level.

Powerful artificial intelligence tools are being used by various actors, such as the United Nations, the private sector, governments, and academia to collect and analyse data related to complex policy issues. In fact, the technology is currently being assessed for imminent use as a conflict early-warning system. As recent natural disasters and man-made crises around the world have shown, social and digital media are increasingly being used during emergencies to share news, coordinate responses, express opinions, and organize future action. It is important to note, however, that unobtrusive measures are stronger and most useful when used in conjunction with obtrusive methods – in the case of influence operations, content-analysis of social media through artificial intelligence could be supplemented by direct observations and interviews conducted over the course of regular civil-military operations. Although further research is warranted, the review of the literature as well as interviews conducted with pioneers of this technology suggest that artificial intelligence of digital media could be used to assess the effectiveness and success of influence operations in hostile environments, especially when such attitudes or behaviours may be socially sensitive and might not lend themselves well to participant

⁶¹ Yost, David. "The Campaign Against INF in West Germany." In Brian D. Dailey and Patrick J. Parker (eds.). *Soviet Strategic Deception*. (Lexington, MA: Lexington Books, 1987).

self-assessment, or when pre-effect data collection capacities are limited and the establishment of a baseline is not possible.

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Little research in either the military or civilian sphere has attempted to assess the effects, degree of effects, and success of influence operations, particularly in hostile environments where it may prove both difficult and unreliable to conduct traditional interviews and opinion polls. Yet it has been asserted that the decisive effects of influence operations are apparent, and can therefore be measured. This report examines the challenges, limitations, and opportunities inherent to the measurement of the effects and success of influence operations on civilian populations in hostile environments. The report discusses the limitations of current methodologies and the opportunities associated with unobtrusive measures. This discussion is based on a systematic review of the literature in the fields of psychology, anthropology and sociology, and interviews conducted with pioneers of artificial intelligence technology as a conflict early-warning system. Artificial intelligence of social media could be used to assess the effectiveness and success of influence operations in hostile environments, especially when attitudes or behaviours may be socially sensitive and might not lend themselves well to participant self-assessment, or when pre-effect data collection capacities are limited and the establishment of a baseline is not possible.

Peu de recherches dans les sphères militaire ou civile ont été menées pour tenter d'évaluer les effets, le degré des effets et le niveau de réussite des opérations d'influence, en particulier dans les milieux hostiles où il pourrait s'avérer difficile et peu concluant de réaliser des entrevues et des sondages d'opinion par des méthodes traditionnelles. Cependant, il a été affirmé que les effets décisifs des opérations d'influence étaient observables et, par le fait même, mesurables. Le présent rapport étudie les défis, les limites et les possibilités de l'évaluation des effets et du niveau de réussite des opérations d'influence effectuées auprès de populations civiles en milieux hostiles. Il traite également des limites des méthodes utilisées actuellement, ainsi que des possibilités liées aux mesures discrètes. La démarche se fonde sur un examen systématique de documents issus des domaines de la psychologie, de l'anthropologie et de la sociologie, ainsi que sur des entrevues menées auprès de pionniers des technologies de l'intelligence artificielle utilisées par exemple pour les systèmes d'alerte rapide lors de conflits. Il serait possible de recourir à l'intelligence artificielle des médias sociaux afin d'évaluer l'efficacité et le niveau de réussite des opérations d'influence en milieux hostiles, en particulier lorsque les attitudes ou les comportements sont délicats sur le plan social et ne se prêtent pas bien à l'auto-évaluation des participants, ou lorsque les capacités de collecte des données avant la tenue des opérations sont limitées et qu'il est impossible d'établir une base de référence.

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influence operations; hostile environments; social sciences; literature review