The making of a cryptologic language analyst
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Over the past 10 years NSA/CSS—through Language Transformation—has implemented an aggressive set of interdependent initiatives designed to improve its foreign language posture and readiness.

Fundamental to Language Transformation is the recognition that a Cryptologic Language Analyst (CLA) brings numerous skills to the task, including target knowledge, analytic interpretation, SIGINT expertise, technology know-how, teaching and mentoring abilities, adaptability, and customer relations. These skills are in addition to the central skill the CLA must have—high-level language and culture ability, which is acquired over years of instruction, learning, and experience.

In a comprehensive investigation, CASL studied CLAs’ language learning careers. This evidence-based research synopsis outlines the key principles of Language Transformation, the time it takes to acquire sufficient language skills, the factors contributing to successful language ability, and the distinct contribution CLAs make to the analytic process. We draw chiefly on the results of our NSA research, calibrated with our State Department and FBI language expertise findings and supported by the wider scientific literature on foreign language learning.

Investing in language expertise

Underpinning NSA/CSS Language Transformation were two key principles:

1. **The minimum proficiency level is 3/3**—Level 3/3 Listening/Reading is the minimum operational proficiency level required for cryptologic language work. Level 3 is described as “reading and listening between the lines,” with level 4 “beyond the lines.” Job conditions make the work harder primarily because the analyst is not the intended recipient of the messages.

2. **Proficiency takes three to eight years**—It takes three to eight years to build a 3/3 cryptologic language analyst, depending on the person, the language, the starting point, and the opportunities afforded to the individual.

**Important language learning success factors**

Our research has identified language learning success factors (Figure 1) that are underpinned by several driving forces (Table 1), all dependent on CLA time on task. Time on task not only involves sheer number of hours, but it also entails a substantial sustained effort by the CLA to engage in focused, interactive language learning and deep language use experiences.

<table>
<thead>
<tr>
<th>Driving forces in language learning success</th>
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<tbody>
<tr>
<td>✓ Motivation and initiative</td>
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<td>✓ Focus on language</td>
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<tr>
<td>✓ Sustained effort</td>
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<tr>
<td>✓ Deep use experiences</td>
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<td>✓ Effortful learning</td>
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Many language analysts begin their careers with level 2/2 proficiency, and most are immediately faced with workplace demands at level 3/3 or higher—frequently in languages that are the hardest and most difficult to learn for native speakers of English. What this means is that they must enhance their language while already employed.
full-time in highly demanding positions. The challenge is to ensure ample opportunities for them to engage in the experiences shown in Figure 1 both within and outside the workplace.

Given that language analysts are generally required to have only listening and reading skills on the job, a somewhat surprising finding is that many language analysts cited “efforts at speaking” as a critical factor in their language learning success. That is why speaking is recognized at NSA as an important enabling skill. Having

![Diagram of factors that help analysts move from proficiency levels 2 and 2+ to 3 and above.](image)

Figure 1. Factors that help analysts move from proficiency levels 2 and 2+ to 3 and above.
reached higher level listening through practice with native speakers, analysts can piece together incomplete conversations, reasonably predicting what is missing.

Return on investment

High-level cryptologic language analysts are greater than the sum of their parts; they are intelligence analysts with deep language expertise. Congruity judgment enables them to read and listen between and beyond the lines within the mindsets of their targets, and thus understand and articulate the intent of the messages.

Consider:

- 2/2 language analysts miss critical information that 3/3 analysts will capture.
- A 3/3 language proficiency implies a more sophisticated knowledge and understanding of culture and linguistic analysis. Thus, 3/3 analysts already have language skills that transfer across missions, and the period of time to adjust to new work contexts is reduced.
- Analysts who have learned one foreign language can learn others much more quickly. Our study participants knew an average of at least one other language at level 3 or 4 and other languages at any level, with one analyst knowing 11 languages!

There are no easy, “drive-through” alternatives to the investment in cryptologic analysts’ foreign language expertise. The obvious solution of hiring native or near-native speakers of the required foreign languages who have English competence and then investing in their development as cryptologists is practiced fully within national security constraints. However, such a solution is costly and problematic, and the pool of educated native speakers is not as accessible as one might think. Also problematic, machine translation is, at best, a level 1+/2, with uneven quality across languages. In some cases, specific technologies are used to help identify and translate finite words, languages, speakers, and even basic messages. However, the quality of the input to these technologies must be excellent, and the preparation time and size of the training sample materials are quite significant. The human cryptologic analyst with high-level foreign language skills is still the best option.

Thus, a clear solution is to continue building language expertise while investing in mechanisms to make the process more efficient and to insert the best technologies within the cryptologic work process. CASL is researching both of these interdependent dimensions: methods to ensure more optimal human-computer interactions and methods that determine in advance which cryptologic language analysts have the aptitude and stamina to reach 3/3 and beyond and then to accelerate their foreign language learning through enhanced cognitive neuroscience, training, and assignments, including the foreign language success factors described above.

About This Synopsis: This CASL research synopsis is based on research findings reported in Pathways to success: The professional proficiency of foreign language professionals. Readers are invited to examine the entire four-volume report for greater detail. Principal Investigator: Catherine Doughty, PhD. University of Maryland Center for Advanced Study of Language. (301) 226-8828, cdoughty@casl.umd.edu, www.casl.umd.edu. Funding/Support: This material is based upon work supported, in whole or in part, with funding from the United States Government. Any opinions, findings and conclusions, or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the University of Maryland, College Park and/or any agency or entity of the United States Government. Nothing in this report is intended to be and shall not be treated or construed as an endorsement or recommendation by the University of Maryland, United States Government, or the authors of the product, process, or service that is the subject of this report. No one may use any information contained or based on this report in advertisements or promotional materials related to any company product, process, or service or in support of other commercial purposes. The Contracting Officer’s Representative for this project is David Cox, Government Technical Director at CASL, (301) 226-8970, dccox@casl.umd.edu.