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A frequently neglected area of personnel training research is training needs assessment. We specifically examined the impact of individuals' work experience, self-efficacy, and levels of skill proficiency on their subsequent ratings of training needs. Results indicate that self-efficacy and skill proficiency are influential, with proficiency displaying a more potent impact.

Training needs assessment (TNA) is a critical and initial stage in the design and development of training programs. Such assessment captures information spanning where and why training is needed (organizational focus), who needs to be trained (person focus), and what must be incorporated as program content (task focus; Goldstein, 1993; Noe, 2005). Conducting a systematic TNA can significantly impact the overall effectiveness and quality of a program (Goldstein & Ford, 2002; Kraiger & Aguinis, 2001; McGehee & Thayer, 1961). The information generated during TNA allows for data-driven decisions surrounding the design, development, and delivery of training content, as well as criterion development for evaluation (Arthur, Bennett, Edens, & Bell, 2003). Despite the crucial nature of TNA, empirical work on this subject has been limited (Tannenbaum & Yukl, 1992). Salas and Cannon-Bowers (2001) further emphasize this dearth of research in their recent review of the field of training, "… it is interesting to note that whereas most training researchers believe and espouse that training needs analysis is the most important phase in training, this phase remains largely an art rather than a science" (p. 477). Therefore, considering the substantial role TNA plays in the overall success of training and the sheer amount of financial resources dedicated to training in modern

organizations (billions of dollars annually; Noe, 2005), this lack of systematic research clearly creates a dilemma for both training practitioners and researchers.

Within TNA, task focused analyses serve a central role in that they provide specific information directly used to determine program content. This information can range from the tasks that must be performed within a given work role to the various knowledge, skills, and abilities necessary for performance (Goldstein, 1993). Sources for this information are typically supervisors or incumbents (Noe, 2005). Unfortunately, whether or not such sources provide unbiased TNA information remains a largely untested assumption (Kraiger & Aguinis (2001). An inventory approach is often used to capture task focused TNA data (Ford, Smith, Sego, & Quinones, 1993). Thus, this focus is similar to conducting job analysis. However, job analysis can be undertaken for a wide variety of personnel purposes in which training is but one (Sackett & Laczo, 2003). When prior job analysis results are available, TNA data will frequently augment previous results by focusing on select areas to be trained (e.g., subset of competencies), rather than the requirements of the entire work role. This is especially the case when a thorough organizational focused TNA delineating the alignment of training with organizational goals has been conducted. Nonetheless, job analysis research can inform predictions within TNA research as it deals with how individuals perceive and assess work role requirements.

Job analysis research indicates that several individual-level variables may impact ratings. These factors have included experience or tenure (e.g., Dierdorff, Wilson, & Carter, 2003; Landy & Vasey, 1991; Richmann & Quinones, 1996; Tross & Maurer, 2001), as well as performance and cognitive ability (e.g., Aamodt, Kimbrough, Keller, & Crawford, 1982; Harvey, Friedman, Hakel, & Cornelius, 1988; Henry & Morris 2000). To date, very few studies have systematically examined ratings within a TNA paradigm. One exception has been Ford et al. (1993) who investigated the extent to which task experience, self-efficacy, and general cognitive ability affected ratings of training emphasis for job tasks. They found that increased experience and self-efficacy led to higher training emphasis ratings. Similar to prior job analysis research, the focus of the Ford et al. (1993) study was restricted to only task ratings. As other types of work descriptors are commonly captured during TNA (e.g., skills), additional research is clearly needed. Furthermore, some job analysis research suggests that the use of different descriptors can have differential effects on ratings themselves (e.g., Dierdorff & Wilson, 2003; Morgeson, Delaney-Klinger, Mayfield, Ferrara, & Campion, 2004). Thus, the purpose of the present research was to build upon the rather modest TNA research by investigating the potential influence of individual-levels factors on subsequent ratings of training needs.

Scope of Present Study

Because job analysis research has indicated that ratings may vary due to influences beyond those attributable to individual-level factors, such as work descriptor (e.g., task, skill, knowledge, etc.) and/or the chosen rating scale (e.g., importance or frequency; Conte, Dean, Ringenbach, Moran, & Landy, 2005; Dierdorff & Wilson, 2003), we similarly framed our empirical investigations. More specifically, we delineated our examinations across two descriptors (task and skill items) and two rating scales (importance and frequency). Based upon related job analysis research and the only relevant empirical

work in the TNA literature (i.e., Ford et al., 1993), we included the individual-level factors of work experience, self-efficacy, and skill proficiency within our study.

Work Experience

As aforementioned, a number of job analysis studies have shown that work experience can be related to task ratings (e.g., Schmitt & Cohen, 1989). Likewise, Ford and colleagues (1993) found similar relationships in ratings of training needs. These findings have an intuitive appeal in that individuals with greater job experience should have more opportunities to engage in the requisite activities inclusive of that work role and thus, should be better able to distinguish these activities. Moreover, expertise often follows increased work experience and this expertise could impact TNA ratings. A substantial body of literature suggests that experience and expertise are closely linked (Chi, Feltovich, & Glaser, 1981; Chi, Glaser, & Rees, 1982; VanLehn, 1996). Richmann and Quinones (1996) emphasize the importance of how work experience is operationalized and note that measures of job tenure may only narrowly define such experience. Ford et al. (1993) also argue the importance of incorporating the amount of actual experience individuals may gain on the job. Thus, we chose to assess work experience through measuring the amount of actual experience and job tenure. We hypothesized that work experience would be related to both importance and frequency ratings of tasks and skills.

Self-efficacy

Self-efficacy is generally defined as the belief in one's capability to successfully perform a given task (Bandura, 1977; 1997). Self-efficacy has been shown to be associated with a wide variety of training-related variables such as effort and persistence (Quinones, 1995), training performance (Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), and reactions to training (Gist, Schwoerer, & Rosen, 1989). Although no job analysis research has specifically examined self-efficacy, individuals' performance levels in specific facets of job performance have been shown to relate to importance ratings of those job dimensions (Henry & Morris, 2000). Ford et al. (1993) found that self-efficacy was positively related to ratings of training emphasis. With increased self-efficacy comes more confidence in the capacity to perform a work role's activities. Individuals that are higher in self-efficacy are more likely to perform the entirety of work role activities. The increased confidence should lead high self-efficacy individuals to engage in their work role activities more often than low self-efficacy individuals. This influence would serve to increase ratings taken from these individuals. Because one effect of higher self-efficacy is increased prevalence of task performance, we hypothesized that self-efficacy would be positively related to ratings of tasks and skills, but would be stronger for scales of frequency than importance.

Skill Proficiency

The job analysis literature suggests that education and knowledge can influence ratings (Green & Veres, 1990; Landy & Vasey, 1991). Cognitive ability has been shown to be related to the ability to learn in training programs (Ree & Earles, 1991). However, more specific to TNA, Ford et al. (1993) found that cognitive ability generally did not impact ratings of training emphasis. It could very well be that general cognitive ability should not be expected to influence ratings of training needs due to its more global relationship to behavior. Perhaps a more potent variable is the level of proficiency an individual possesses relative

to specific work role requirements. In other words, increasing the variable specificity to the skill-level from the ability-level may reveal more meaningful relationships. A similar effect has been shown in job analysis research where dimension-specific job performance was related to ratings, while overall job performance by itself was not (Henry & Morris, 2000). Similar to high self-efficacy individuals, those with high skill proficiency will be more likely to engage in work role activities. These individuals will also be more likely to be better performers. Therefore, we hypothesized that skill proficiency would be positively related to importance and frequency ratings for tasks and skills. This relationship should be stronger for skill ratings because of the nomonological similarities (i.e., skill judgments and skill proficiencies). For similar reasons as to self-efficacy, we predicted that these relationships would be stronger for ratings of frequency.

Method

Participants

Our participants were incumbents from a large military command whose personnel routinely conduct a variety of specialized training and operational missions around the globe. Participants who were included in our study met several criteria. Besides for being a member of one these specialized units, each had been deployed on a mission in the past four years and had received military-sponsored training for a language at least once during their career. A total of 205 individuals were included in this sample.

Measures

Tasks. Based on the results from focus groups conducted during a previous organizational needs analysis of foreign language capabilities, specific tasks were generated and included in a web-based inventory. These tasks fell into two categories: (1) general language requirements and (2) mission-specific language requirements. Eight tasks comprised the general category and were rated using scales of importance and frequency. Eleven tasks comprised the mission-specific category and were rated using an importance scale. Importance scales consisted of five points ranging from *not important* to *critical*. Frequency scales also consisted of five points ranging from *never* to *very often*. A sample task item from the general category was "Thinking about the use of formal language in conversation with people in the deployment location. Example: Giving a thank you speech to local country hosts or conducting business negotiations with officials. How often do you use this formal language? How important is formal language to completing core SOF tasks?" A sample task item from the mission-specific category was "How important do you believe language proficiency is for persuading people to provide sensitive information?" For purposes of analysis, we computed mean ratings for each task category and scale type. The coefficient alphas for these composites were .81, .79, and .91 for general language requirement importance and frequency ratings and mission-specific language requirement importance ratings, respectively.

Skills. Four language skills were included in the inventory: speaking, writing, reading, and listening. These skills were identified by the previous job analysis as important work requirements for all participants. Skills were rated using the same five-point frequency scale as with the tasks.

Work experience. Level of work experience was assessed with two separate items. The first was directed at the amount

of actual work experiences and asked respondents to indicate how many times they had been deployed on exercises or operations throughout their career. This item was rated using a five-point scale of 1 = *have not been deployed*, 2 = *1-2 times*, 3 = *3-4 times*, 4 = *5-6 times*, and 5 = *more than 6 times*. The second item assessed job tenure and was rated using a seven-point scale ranging from 1 = *less than one year* to 7 = *more than 20 years*, with a midpoint of 4 = *9-12 years*.

Self-efficacy. Self-efficacy was assessed using a three-item scale. Each item began with the stem "I feel confident in my ability to …" and was followed by a generalized work activity. These activities were "military terminology in the language required by my assignment," "satisfy minimum courtesy requirements and maintain very simple face-to-face conversations on familiar topics in the language required by my assignment," and "participate in informal conversations on practical, social, and professional topics in the language required by my assignment." A mean self-efficacy score was calculated for each participant (coefficient alpha = .92).

Skill proficiency. Skill proficiency was based upon scores on from the Defense Language Proficiency Test (DLPT). The DLPT is an instrument designed by the Defense Language Institute to measure listening and reading proficiency. DLPT is divided into two components (listening and reading tests). DLPT scores on each component can fall into one of seven scores (*0*, *0+*, *1*, *1+*, *2*, *2+*, and *3*), with higher scores equating to greater skill proficiency. See Silva and White (1993) for more information on the DLPT. The two DLPT component scores were averaged to create a composite measure of skill proficiency for each participant (coefficient alpha = .93).

Analyses

Correlational analysis and hierarchical multiple regression were used to analyze the relationships between study variables. Seven hierarchical regressions were conducted across the different types of TNA ratings. Hierarchical regressions occurred in two stages. In the first stage, the two work experience variables were entered along with a control variable representing the difficulty of the respondent's learned language. Because the specific languages used varied across respondents, as did the level of difficulty to learn these various languages, it was important to control for possible effects. We assessed language difficulty with a scale used by the military and other government agencies, which classifies languages into four categories that reflect the increasing difficulty of a native English speaker to learn the language (Silva & White, 1993). For example, Spanish is a Category I language, German is a Category II, Russian is a Category III, and Arabic is a Category IV. In the second stage of the hierarchical regressions, self-efficacy and skill proficiency scores were entered. This entry order was chosen to allow the estimation of the independent effects of self-efficacy and skill proficiency beyond that of work experience. The rationale driving this choice stems from the notion that with increased work experience, an individual's self-efficacy and subsequent proficiency are likely to increase.

Results

Table 1 displays the descriptive statistics for study variables. Language difficulty was significantly and inversely related to all but two types of TNA ratings (speaking and listening skills). The work experience measures were generally unrelated to the ratings. Self-efficacy was significantly and positively related to all ratings. Self-efficacy tended to be more highly related to ratings

using scales of frequency than importance. Skill proficiency was significantly and positively related to all ratings and tended to show stronger relationships to frequency ratings. In addition, skill proficiency was more highly related to TNA ratings than was self-efficacy.

Table 2 displays the hierarchical regression results. With the exception of listening and speaking skill ratings, significant variance was accounted for across task and skill ratings and frequency and importance scales. However, in only one case was work experience a significant predictor of ratings (e.g., frequency ratings of general language requirement tasks, β = .24). The second stage of hierarchical regression added self-efficacy and skill proficiency. A significant increase in variance accounted for beyond the first stage variables was provided for all ratings (average R^2 = .18). The mean ΔR^2 was .11 across the rating types. Self-efficacy was a significant predictor of frequency ratings of general language requirement tasks only (β = .18). However, skill proficiency significantly predicted all rating types, with standardized beta estimates ranging from .24 to .44. Skill proficiency appears to be more highly predictive of skill ratings than of task ratings and, across task ratings, does not seem to differ in prediction based upon rating scale.

Discussion

The general goal of this research was to investigate the potential influence of work experience, self-efficacy, and skill proficiency on various types of TNA ratings, including importance and frequency ratings on tasks and skills. Overall, our results indicate that such ratings are significantly related to the individual-level factors of self-efficacy and skill proficiency. However, when collectively considered, skill proficiency appears to be the more powerful of these influences. The results of this study make a significant contribution to the training literature by specifically answering previous calls for TNA research (e.g., Salas & Cannon-Bowers, 2001) and by extending the only other study to systematically examine TNA ratings to date (i.e., Ford et al., 1993).

Contrary to our hypothesis and previous research, our findings indicate that individuals' levels of work experience are largely unrelated to subsequent ratings of tasks and skills in TNA. This finding holds across two operationalizations of work experience used in the present study; namely, job tenure and the amount of actual work experiences. Ford et al. (1993) found experience to be related to task ratings of training emphasis. In the current study, this finding is minimally echoed as actual work experience was significantly correlated with only frequency ratings of general language tasks. One possible explanation for these differing results could be the nature of our experience measures. Ford et al. used very specific measures of activity-level and breadth of task experience, whereas we used more general measures of tenure and breadth of job experience (amount of actual work experiences). This difference in level of specificity of the experience measures may very well impact subsequent relationships. Another explanation could stem from the inclusion of language difficulty as a control, which was significantly related to the majority of rating types. Ford and colleagues likewise discuss the possibility of task difficulty as a moderating influence on experience and ratings, a possibility that appears to have been realized in our findings. Lastly, the nature of the training needs being assessed in this study may have impacted the experience-ratings relationships. Whereas many task focused TNA capture ratings on specific work

activities, our task ratings involved the use of language in accomplishing work-related activities. Perhaps, this overlaying characteristic involves an additional dynamic to work experience. Future research is needed to more thoroughly examine how work experience and descriptor specificity (task, skill, knowledge, etc.) impact TNA ratings.

Partially supporting our hypotheses, results suggest that the self-efficacy levels and skill proficiencies of those providing ratings of training needs influence their ratings. This finding appears to span both rating scale (frequency and importance) and descriptor (skills and tasks), suggesting that highly proficient and high self-efficacy individuals are more likely to rate tasks and skills as more important and performed more frequently. However, what stands out most from the hierarchical regression results is that of these two factors, skill proficiency clearly plays the dominant role in predicting TNA ratings. Comparatively, an individual's skill proficiency significantly predicted all seven types of ratings, whereas self-efficacy only predicted a single rating type. These findings suggest that an individual's *actual* capability (skill proficiency) is a much more potent influence on ratings of training needs than that of his/her *perceived* capability (self-efficacy). Ford et al. (1993) found no relationship between general cognitive ability and task ratings of training needs. The current results lend support to our argument that the shift to more specific individual-level factors, such as skill-based measures, may reveal more meaningful relationships. Additional research is necessary to comparatively investigate the potential impact of skill proficiency and general cognitive ability on TNA ratings. It is important to note that our respondents were well aware of their skill proficiency and this knowledge likely influenced their levels of self-efficacy, despite the job-focused nature of the measure.

For the training practitioner, our results further bolster a point of concern previously raised by Ford and colleagues (1993) when they stated, "ratings of what should be trained may be more in the eye of the beholder than previously acknowledged in the literature" (p. 589). In other words, the differences in ratings may be due to idiosyncratic influences rather than actual training needs. Our results indicate that skill proficiency is one such influence and is reflected in ratings of skill and task importance and frequency of performance. These findings have practical implications ranging from the selection of subject matter experts for TNA to the accuracy or utility of decisions based upon training needs ratings. Assuming that well designed training programs are predicated on these ratings, differences in judgments of training needs due to individuals' own skill proficiencies and not overall work role requirements becomes increasingly problematic. Another interesting implication is that many of these influential factors are likely to be captured during person focused TNA. In this case, data would readily exist for practitioners to investigate possible effects, rather than simply assuming away or ignoring biasing influences. Important to note is that we included only two individual-level factors in our research. Certainly, many more are relevant to training research and typically captured in person focused TNA (e.g., motivation to learn). These factors should be explored by future research.

In conclusion, our research shows that individual factors influence both skill and task ratings in training needs assessment. These findings reflect those within the job analysis literature, although the present results can be seen as slightly stronger than typically found in job analysis research. For the training practitioner, we hope the current findings highlight the importance of

considering exactly how individuals may systematically differ in their perceptions of training needs. We also hope that this study will lead researchers to conduct more expansive empirical work within the realm of training needs assessment, which has been a much neglected area of training and development research.

References

Aamodt, M. G., Kimbrough, W. W., Keller, R. J., & Crawford, K. J. (1982). Relationship between sex, race, and job performance level and the generation of critical incidents. *Educational and Psychological Research, 2*, 227-234.

Arthur, W. Jr., Bennett, W. Jr., Edens, P. S., & Bell, S. T. (2003). Effectiveness of training in organizations: A meta–analysis of design and evaluation features. *Journal of Applied Psychology, 88*, 234–245.

Bandura, A. (1977). *Social Learning Theory*. New York: General Learning Press.

Bandura, A. (1997*). Self-efficacy: The exercise of control.* New York: W.H. Freeman.

Chi, M. T. H., Feltovich, P. J., & Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. *Cognitive Science, 5*, 121-152.

Chi, M. T. H., Glaser, R., & Rees, E. (1982). Expertise in problem solving. In R. J. Sternberg (Ed.), *Advances in the psychology of human intelligence* (p. 7-75). Hillsdale, NJ: Lawrence Erlbaum Associates.

Conte, J. M., Dean, M. A., Ringenbach, K. L., Moran, S. K., & Landy, F. L. (2005). The relationship between work attitudes and job analysis ratings: Do task rating scale type and task discretion matter? *Human Performance*, 18, 1-21.

Dierdorff, E. C., & Wilson, M. A. (2003). A meta-analysis of job analysis reliability. *Journal of Applied Psychology, 88*, 635-646.

Dierdorff, E. C., Wilson, M. A., Carter, L. (2004, April). *Effects of tenure on the quality of incumbent job analysis ratings*. Paper presented at the 19th Annual Conference of the Society for Industrial and Organizational Psychologists, Chicago, IL.

Ford, J. K., Smith, E., Sego, D., & Quinones, M. (l993). The impact of individual and task experience factors on training needs assessment ratings. *Journal of Applied Psychology, 78*, 583-590.

Gist, M. E., Schwoerer, C., & Rosen, B. (1989). Effects of alternative training methods on self-efficacy and performance in computer software training. *Journal of Applied Psychology, 74*, 884-891.

Goldstein, I., & Ford, J.K. (2002). *Training in organizations* (4th edition). Pacific Grove, CA: Wadsworth: Thomson Learning.

Goldstein, I. L. (1993). *Training in organizations: Needs assessment, development, and evaluation* (3rd ed.). Pacific Grove, CA: Brooks/Cole.

Green, S.B., & Veres, J.G. III (1990). Evaluation of an index to detect inaccurate respondents to a task analysis inventory. *Journal of Business and Psychology, 5*, 47-61.

Harvey, R. J., Friedman, L., Hakel, M. D. & Cornelius, E. T. (1988). Dimensionality of the job element inventory, a simplified worker-oriented job analysis questionnaire. *Journal of Applied Psychology, 73*, 639-646.

Henry, M. S., & Morris, S. B. (2000, April). *Incumbent performance level as a predictor of job analysis ratings*. Paper presented at the 15th Annual Conference of the Society for Industrial and Organizational Psychology, New Orleans.

Kraiger, K., & Aguinis, H. (2001). Training effectiveness: Assessing training needs, motivation, and accomplishments. In M. London (Ed.), *How People Evaluate Others in Organizations* (p. 203-220). Mahwah, NJ: Lawrence Erlbaum.

Landy, F. J., & Vasey, J. (1991). Job analysis: The composition of SME samples. *Personnel Psychology, 44*, 27-50.

McGehee, W., & Thayer, P. W. (1961). *Training in Business and Industry*. New York: John Wiley & Sons, Inc.

Morgeson, F. P., Delaney-Klinger, K. A., Mayfield, M. S., Ferrara, P., & Campion, M. A. (2004). Self-presentation processes in job analysis: A field experiment investigating inflation in abilities, tasks, and competencies. *Journal of Applied Psychology, 89*, 674-686.

Noe, N. A. (2005). *Employee Training & Development* (3rd ed.), Burr Ridge, IL: Irwin McGraw-Hill.

Quinones (1995). Pretraining context effects: Training assignment as feedback. *Journal of Applied Psychology, 80*, 226-238.

Ree, M. J., & Earles, J. A. (1991). Predicting training success: Not much more than g. *Personnel Psychology, 44(2)*, 321-332.

Richmann, W. L., & Quinones, M. A. (1996). Task frequency rating accuracy: The effect of task engagement and experience. *Journal of Applied Psychology, 81*, 512-524.

Sackett, P. R., & Laczo, R. M. (2003). Job and work analysis. In W.C. Borman, D. R. Ilgen, & R.J. Klimoski (Eds.), *Comprehensive Handbook of Psychology, Volume 12: Industrial and Organizational Psychology* (p. 21-37). New York: John Wiley & Sons.

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: A decade of progress. *Annual Review of Psychology, 52*, 471-499.

Schmitt, N., & Cohen, S. A. (1989). Internal analyses of task ratings by job incumbents. *Journal of Applied Psychology, 74*, 96-104.

Silva, J. M., & White, L. A. (1993). Relation of cognitive aptitudes to success in foreign language training. *Military Psychology, 5*, 79-93.

Tannenbaum, S. I., & Yukl, G. (1992). Training and development in work organizations. *Annual Review of Psychology, 43*, 399-441.

Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cannon-Bowers, J. A. (1991). Meeting trainees' expectations: The

influence of training fulfillment on the development of commitment, self-efficacy, and motivation. *Journal of Applied Psychology, 76*, 759-769.

Tross, S. A., & Maurer, T. J. (2000). The relationship between SME job experience and job analysis ratings: Findings with and without statistical control. *Journal of Business and Psychology, 15*, 97-110.

VanLehn, K. (1996). Cognitive skill acquisition. *Annual Review of Psychology, 47*, 513-539.

Table 1. Descriptive Statistics for Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. GLR Tasks Frequency	3.67	0.72	-											
2. GLR Tasks Importance	3.75	0.66	.73	-										
3. MBR Tasks Importance	3.96	0.72	.61	.68	-									
4. Speaking Language Skills	3.88	1.19	.55	.49	.51	-								
5. Listening Language Skills	4.12	1.17	.56	.52	.52	.83	-							
6. Reading Language Skills	3.08	1.17	.51	.55	.51	.59	.60	-						
7. Writing Language Skills	2.37	1.19	.54	.48	.40	.46	.45	.73	-					
8. Language Difficulty	2.19	1.27	-.27	-.31	-.17	-.13	-.05	-.20	-.33	-				
9. Job Tenure	2.82	1.29	.06	.04	.02	-.01	.07	.05	.07	.04	-			
10. Actual Work Experiences	3.78	1.45	.20	.06	.07	.08	.13	.01	.04	-.01	.15	-		
11. Self-efficacy	3.67	1.10	.41	.29	.22	.21	.24	.28	.31	-.27	.05	.18	-	
12. Skill Proficiency	4.81	1.86	.43	.37	.33	.31	.40	.43	.44	-.33	.04	.08	.64	-

Note. GLR = general language requirements; MBR = mission-based language requirements; all correlations over .17 are significant at $p < .01$.

Table 2. Hierarchical Regression Results

Variable	GLR Tasks Frequency	GLR Tasks Importance	MBR Tasks Importance	Speaking Language Skills	Listening Language Skills	Reading Language Skills	Writing Language Skills
Step 1							
Language difficulty	-.26**	-.24**	-.18**	-.14*	-.08	-.22**	-.32**
Job tenure	.05	.01	-.02	-.03	.04	.08	.10
Actual work experiences	.07	.24**	.06	.09	.14*	.02	.03
R^2	.08**	.12**	.04*	.03	.03	.06**	.11**
Step 2							
Self-efficacy	.05	.18*	.01	.01	-.04	-.01	.02
Skill proficiency	.27**	.26**	.24**	.32**	.44**	.41**	.35**
Total R^2	.19**	.25**	.09**	.11**	.18**	.20*	.25**
ΔR^2	.11**	.13**	.05**	.08**	.15**	.14**	.14**

Note. GLR = general language requirements; MBR = mission-based language requirements; skills are rated using frequency scales.

* $p < .05$

** $p < .01$

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