

WHY, WHEN AND HOW TO USE GENERAL KNOWLEDGE TESTS?

Predrag Zarevski

Department of Psychology

Faculty of Humanities and Social Sciences, University of Zagreb

Ivana Lučića 3, 10 000 Zagreb

pzarevsk@ffzg.hr

Dragutin Ivanec

Department of Psychology

Faculty of Humanities and Social Sciences, University of Zagreb

Ivana Lučića 3, 10 000 Zagreb

divanec@ffzg.hr

Krunoslav Matešić, Jr.

Catholic University of Croatia

Ilica 242, 10 000 Zagreb

krunoslav.matesic@unicath.hr

Abstract

General knowledge tests (GKT) examine knowledge which is not usually associated with institutionalized education, but is part of everyday communication and often found in the media. Indirectly, they measure the ability to acquire knowledge and, in this sense, coincide with the definition of crystallized intelligence as a measure of acquiring and using knowledge. Three studies using relatively short versions of the GKT on various samples in the Republic of Croatia, which were part of a larger battery of cognitive tests with a similar number of items and reliability, the GKT has consistently shown the greatest projection on the principal component of these tests. This answers the question of *why* we need the GKT: carefully selected general knowledge items can serve as a measure of Gc. *When* to use the test has several options. The first is in situations where there is a lack of time – 50 items require less than 20 minutes. The second is a formal reason – in cases of resistance to or a ban on intelligence testing, using the GKT goes over well. The third is a humane reason – due to its form and title, it causes less stress and test anxiety as it is easier to be uninformative than unintelligent as far as self-respect is concerned. There is also the question of *how* to use the GKT. Some items become recognized, some lose their importance with technological advances and socio-political changes, new potentially good items appear so the GKT needs to be revised every 5 to 10 years. This is valid for the choice and range of general knowledge domains. As far as GKT calibration is concerned, with the aim of constructing tests of good internal reliability (which is necessarily lower than the majority of unifacted

classic intelligence tests), separate calibration is recommended in relation to gender and education (high schools, professional schools, tertiary education). However, in view of the increasing availability of general information, such a differential calibration may be subject to review.

Key words: Crystallized intelligence, gender differences, General knowledge tests, General information tests, test anxiety

INTRODUCTION

General knowledge tests (GKT) examine knowledge which is not usually associated with institutionalized education, but are part of everyday communication and often found in the media. They have a satisfactory discriminatory validity in relation to tests of formal knowledge and “classic” intelligence tests, even though they share a considerable part of variance. They measure the ability to acquire knowledge in an indirect way, particularly the ability to determine the meaning of unfamiliar words based on context. In this sense, they coincide with the definition of crystallized intelligence as a measure of acquiring and using knowledge (Zarevski, 2012). Despite the fact that the GKT examines accumulated knowledge, the measure also serves as an indicator of future knowledge acquisition, i.e. indicates the potential for further learning as well as previously acquired knowledge. This can be very important for predicting the success of further education and professional orientation.

General information (or *knowledge*) is an important construct in Cattell-Horn’s (Cattell, 1971), Carroll’s (1993) and McGrew’s (2005) theories of the structure of intelligence. Although it is primarily a measure of knowledge, it is also a measure of cognitive aptitude and has an important relation to Ackerman’s (1996) theory of interests for intelligence. General knowledge can be considered a unitary construct and can also be broken down into a number of domains, such as knowledge of biology, history, sport, technology, literature, science and so on.

Practicing psychologists are showing an increasing interest in using the GKT, where six general knowledge tests were published in Croatia from 1988 to 2013 (Zarevski, 1988, 1991, 1993, 1995, 2003; Zarevski, Matešić & Matešić, 2013).

The aim of this paper is to consider, primarily on the theoretical level with an analysis of recently collected data, why, when and how to use general knowledge tests. At first glance, there are pros and cons for the use of general knowledge tests. Namely, it may be considered frivolous to extrapolate a psychometric measure of crystallized intelligence using generally available information. In addition, these tests have a somewhat lower internal consistency due to the heterogeneity of the field being examined. In the case of examining general knowledge from a narrow domain, we enter the field of expert knowledge, which is not the primary purpose of the GKT.

Empirical data will be used in answering the first question. Three studies using the abbreviated versions of the GKT in selection situations for different samples in the Republic of Croatia and in batteries with several cognitive measures of similar item numbers, reliability and relative variability were conducted. All three samples comprised of persons with tertiary education, aged between 23 and 40, approximately 2/3 were women. The selection situation minimizes the influence of varying motivation on results. The test batteries differed in the first and the remaining two studies. The first consisted of:

1. g-factor intelligence test – predominantly verbal, symbols used in some items can easily be verbally coded;
2. general cultural knowledge test (knowledge of world and Croatian history, art and culture);
3. general knowledge test (the most general knowledge in the technical areas, natural, social and humanistic sciences, medicine, world religion, business, sports and 20th century most important historical and political events);
4. vocabulary test (an international term is given and the task is to find its closest Croatian translations);
5. test of knowledge of the most recent events in politics, culture, business, techniques, sport and entertainment (year was 2004);
6. English language test.

The second and third studies substituted the intelligence test with the *Professional domain knowledge test*. Data analysis of the first study was conducted for several combinations of manifest variables (with or without the intelligence test and foreign language). The second study also conducted two analyses (with or without foreign language). It has been shown that the GKT consistently had the highest projection on the first principal component (Table 1).

This provides an answer as to *why* use general knowledge tests: if we need a solid measure of crystallized intelligence, carefully selected general knowledge questions can be very useful. Even though vocabulary tests are most commonly used for assessing crystallized intelligence, this series of selection situations has shown that the GKT provides the greatest individual contribution to the principal component of the battery used to measure accumulated knowledge. Of special interest is the finding that even in “competition” with classic intelligence tests used to measure the g-factor, the GKT has the greatest projection on the principal component.

In order to answer the question of *when* to use the GKT, several mutually non-exclusive reasons need to be considered. The first is when there is a lack of time, i.e. economical (50 items are completed in under 20 minutes). The second is a formal reason – in cases where there is resistance to or a ban of the use of intelligence tests, using the GKT is “easier”. The third is a humane reason – due to its form and title, it causes less stress and text anxiety as it is easier to be informed than unintelligent as far as self-respect is concerned. The fourth is clinical, where it is possible to deter-

Table 1. Projections of the tests on the first principal component in the three studies, and percentages of the variance explained with the first principal component of the tests

Test	study I N = 376		study II N = 74		study III N = 91	
	first component		first component		first component	
vocabulary test	0.78	0.78	0.79	0.74	0.74	0.76
general cultural knowledge test	0.83	0.81	0.78			
general knowledge test	0.85	0.83	0.81	0.87	0.87	0.80
knowledge of the most recent events	0.77	0.71	0.68	0.77	0.80	0.68
professional domain knowledge				0.81	0.84	0.71
g-factor intelligence test	0.55	0.58				
English language test		0.68	0.74			0.65
% of variance explained	64	56	52	62	66	52

Note: 1st study – data from Zarevski, P., Ivanec, D., Zarevski, Z. (2005). How general is general knowledge construct. *Psihološka obzorja / Horizons of Psychology*, 14, 9-15.

2nd study data from unpublished study Ivanec, D., Vukosav, Ž., Zarevski, P. (2014). *Evaluation of some new tests*.

3rd study data from unpublished study Bunjevac, T., Ivanec, D., Vukosav, Ž., Zarevski, P. (2014). *Evaluation of some new tests*.

mine the onset of cognitive decline based on information profiles of ipsatized data from various decades. This decline is related to a lack of interest and personality mentioned in Ackerman's theory (1996), as the GKT is not a "pure" psychometric measure of cognitive functioning, but also contains part of the personality and interest variance. For those in selection and clinical assessment, such a measure may be very useful.

The question of *how* to use and construct the test remains. Since some items become recognized, some lose their importance and, with technological advances and sociopolitical changes, some new items arise for testing general knowledge, it is necessary to revise the GKT every 5 to 10 years. This refers to the choice and range of selected domains. Some domains may have the advantage in selection situations but care must be taken not to go too far into expert knowledge.

As far as the calibration of the GKT is concerned, with the aim of creating tests of good internal reliability (which is lower in relation to the majority of unifacted classic intelligence tests), separate calibration with regard to gender and education (high school or professional school, university) is recommended. However, in view of the availability of information technology at home and at school, the justification for such a differential calibration may come into question.

What to conclude? There seem to be many reasons and situations in which to use general knowledge tests. They are economical, interesting to participants (note: we always witness lively debate among participants about certain questions), cause less stress and test anxiety than classic intelligence tests and can be successful in assessing crystallized intelligence. In the sense of *positive manifold* (note: intelligence tests measure various cognitive abilities with correlations between 0.2 and 0.8 – this empirical detail indicates that different intelligence tests measure a common factor known as positive manifold), a test battery which includes a good general knowledge test usually does not require the use of additional intelligence tests, which leaves more time to assess other significant variables (personality, cognitive style, metacognition, motivation etc.).

REFERENCES

- Ackerman, P.L. (1996). A theory of adult intellectual development: Process, personality, interests, and knowledge. *Intelligence*, 22, 227-257.
- Bunjevac, T., Ivanec, D., Vukosav, Ž., Zarevski, P. (2014). *Evaluation of some new tests*. Department of psychology, University of Zagreb (unpublished study).
- Carroll, J.B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge University Press.
- Cattell, R.B. (1971). *Abilities: Their Structure, Growth and Action*. Boston: Houghton Mifflin.

- Ivanec, D., Vukosav, Ž., Zarevski, P. (2014). *Evaluation of some new tests*. Department of psychology, University of Zagreb (unpublished study).
- McGrew, K.S. (2005). The Cattell-Horn-Carroll (CHC) Theory of Cognitive Abilities: Past, Present and Future. In D.P. Flanagan, P.L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 136-181). New York: The Guilford Press.
- Zarevski, P. (2003). *Test opće obaviještenosti, Priručnik* [General Information Test, Manual]. Jastrebarsko: Naklada Slap.
- Zarevski, P. (1988). *Test opće informiranosti, Priručnik* [General Knowledge Test, Manual]. Zagreb: Savez samoupravnih interesnih zajednica za zapošljavanje Hrvatske.
- Zarevski, P. (1991). *Test opće informiranosti za učenike četvrtih razreda srednjih škola (TOIM), Priručnik* [General Knowledge Test for year 12 high school students, Manual]. Zagreb: Zavod za zapošljavanje.
- Zarevski, P. (1993). *Test opće informiranosti (A I B forma), Priručnik I standardizacija za Test opće informiranosti (revidirano izdanje)* [General Knowledge Test (Forms A & B), Manual and standardization of the revised General Knowledge Test]. Zagreb: Ministarstvo rada, socijalne skrbi i obitelji, Zavod za zapošljavanje – Središnja služba Zagreb.
- Zarevski, P. (1995). *Test opće obaviještenosti, Priručnik* [General Information Test, Manual]. Jastrebarsko: Naklada Slap.
- Zarevski, P. (2012). *Struktura i priroda inteligencije (II. prošireno izdanje)*. [Structure and nature of intelligence]. Jastrebarsko: Naklada Slap.
- Zarevski, P., Ivanec, D., Zarevski, Z. (2005). How general is general information construct. *Psihološka obzorja / Horizons of Psychology*, 14, 9-15.
- Zarevski, P., Matešić, K., Matešić, K. Jr. (2013). Test opće informiranosti, TOI – 2012 [General information test, GIT-2012]. Jastrebarsko: Naklada Slap.

ZAŠTO, KAD I KAKO KORISTITI TESTOVE OPĆE INFORMIRANOSTI?

Sažetak

Testovima opće informiranosti (TOI) obuhvaćamo informacije koje uglavnom nisu vezane uz institucionalizirano školovanje, već su dio svakodnevnog govora i često se nalaze u medijima. Na neizravan način mjere sposobnost usvajanja znanja, i u tom se smislu podudaraju s definicijom kristalizirane inteligencije (Gc) kao mjere lakoće usvajanja i korištenja znanja. U 3 primjene razmjerno kratkih verzija TOI-a na različitim uzorcima sudionika u RH i u baterijama s više kognitivnih mjera sličnog broja čestica i pouzdanosti, upravo TOI su dosljedno imali najveću projekciju na prvi glavni predmet mjerenja baterije testova. To daje odgovor na pitanje zašto trebamo TOI: dobro odabran skup pitanja za opću informiranost može poslužiti za mjerenje Gc-a. Na pitanje kad koristiti TOI ima više odgovora. Prvi, kad imamo malo vremena – 50-ak čestica se rješava za manje od 20 min. Drugi je formalni razlog – u slučaju da

postoji otpor/zabrana testiranja inteligencije, testiranje TOI-em "lakše prolazi". Treći je humani razlog – zbog svoje forme i naslova, izaziva manje stresa i testne anksioznosti, jer je za samopoštovanje lakše biti neinformiran nego neinteligentan. Ostaje pitanje kako koristiti TOI? Budući da neke čestice postaju prepoznate, neke gube na važnosti, a s napretkom tehnologije i društveno-političkim promjenama, javljaju se neke nove potencijalno dobre čestice, TOI-e treba revidirati svakih 5-10 g. To se odnosi i na odabir i na opseg domena opće informiranosti. Što se tiče baždarenja TOI-a, u cilju formiranja testova dobre unutarnje pouzdanosti (koja je nužno niža u odnosu na većinu unifacetnih klasičnih testova inteligencije) preporučljivo je odvojeno baždarenje s obzirom na spol i obrazovanje (u smislu gimnazija ili strukovna škola, odnosno SSS ili VSS). No, s obzirom na sve veću dostupnost općih informacija, uskoro može postati upitno diferencijalno baždarenje.

Gljučne riječi: kristalizirana inteligencija, spolne razlike, test opće informiranosti, test općeg znanja, testna anksioznost

Primljeno: 01. 11. 2015.

