

The CDM Bibliography Project

Version 1.1

What is this?

The CDM-Bib is a selected bibliography about diagnostic measurement, created in the context of my PhD thesis. The first section contains suggested reading about CDMs, examples of testing instruments modified or created in a CDM approach, and more reading lists specifically about Q-matrix design. The second section is the bibliography itself, with complete references in APA6 style.

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The CDM approach – general reading

Sub-theme	Citation
Introductory reading	(Gierl, Leighton, & Hunka, 2000; Jang, 2005; Lee & Sawaki, 2009b; Leighton & Gierl, 2007, 2011; Nichols, Chipman, & Brennan, 2012; Rupp, Templin, & Henson, 2010; Tatsuoka, 2009)
Selection of a CDM	(Li, Hunter, & Lei, 2016)
Polytomous attributes and responses	(J. Chen & de la Torre, 2013, 2018; Ding, Luo, Wang, & Xiong, 2016; Yan, Ying, & Dongbo, 2016)
Applying CDMs using R	(Dai, Svetina, & Wang, 2017; Ravand & Robitzsch, 2015; Torre & Akbay, 2019)
Using a connectionist method as a CDM	(Gierl, Cui, & Hunka, 2007; Pardos & Dadu, 2018)
Adaptive testing with a CDM	(P. Chen, Wang, Xin, & Chang, 2017; Cheng, 2009; Frey & Carstensen, 2009; Gierl & Zhou, 2008; Yan et al., 2016; Yigit, Sorrel, & de la Torre, 2019)

Test retrofitting in a CDM or CDM-like approach

Included: studies that apply a CDM approach to an existing instrument.

Excluded: studies based on the Tatsuoka dataset, studies where the focus was on the Q-matrix design (those were detailed in the *Q-matrix design studies*) section, we also avoided studies that used the test data mostly to illustrate a proposed methodology.

Test(s)	Citation
Intrapreneurship test from the ASCOT project	(Bley, 2017)
TIMSS-Mathematics	(Y.-H. Chen, 2006; Y.-H. Chen, Gorin, Thompson, & Tatsuoka, 2006; Choi, Lee, & Park, 2015; Kabiri, Ghazi-Tabatabaei, Bazargan, Shokoohi-Yekta, & Kharrazi, 2017; Kabiri et al., 2017; Skaggs, Wilkins, & Hein, 2016; Su, 2013; Terzi & Sen, 2019; Yamaguchi & Okada, 2018)
TOEFL (English L2)	(Jang, 2005; Kim, 2015; Lee & Sawaki, 2009a; Ranjbaran & Alavi, 2017; Sawaki, Kim, & Gentile, 2009)
NAEP reading and mathematics	(Hansen, Mislevy, & Steinberg, 2008; Xu & von Davier, 2006)
MELAB reading	(L. Gao, 2007; Li, 2011)
Iranian National University Entrance Examination	(Ravand, 2015; Ravand & Robitzsch, 2018)
LanguEdge	(Jang, 2009)

SAT (sample of algebra items)	(Gierl et al., 2007)
SAT (critical reading)	(C. Wang & Gierl, 2011)
Test of English for International Communication (TOEIC)	(Buck, Tatsuoka, & Kostin, 1997; Svetina, Gorin, & Tatsuoka, 2011)
PSAT/National Merit Scholarship Qualifying Test (NMSQT)	(Clark, 2013)
Dutch version of the MCMI-III	(de la Torre, van der Ark, & Rossi, 2015)
Situational judgement test	(Sorrel et al., 2016)

Development of a new instrument in a cognitive assessment approach

Included: studies about the process of creating a new test (i.e. new items and Q-matrix) in a CDM or CDM-like approach.

Excluded: test retrofitting.

Domain	Citation
Architecture	(Katz, Martinez, Sheehan, & Tatsuoka, 1998)
Mathematics (proportions)	(Tjoe & de la Torre, 2014)
Mathematics (teacher's reasoning about proportions)	(Bradshaw, Izsák, Templin, & Jacobson, 2014)
Mathematics (angles)	(Khasanova, 2016)
Mathematics (basics)	(Loye & Lambert-Chan, 2016)
L2 reading comprehension	(Ranjbaran & Alavi, 2017)
Internet addiction	(Tu, Gao, Wang, & Cai, 2017)
Depression	(D. Wang, Gao, Cai, & Tu, 2019)

Articles presenting specific CDMs

CDM	Citation
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DINA	(Junker & Sijtsma, 2001)
DINO	(Templin & Henson, 2006)
MC-DINA (DINA for multiple-choice items)	(de la Torre, 2009)
GDINA	(de la Torre, 2011)
Fusion	(Roussos et al., 2007)
RUM	(Hartz, 2002)
Reduced reparametrized unified model (RRUM) or G-NIDA	(Culpepper & Hudson, 2018)
Log-linear Model (LLM)	(Maris, 1999)
A-CDM	(de la Torre, 2011)
Rule-space methodology (RSM)	(Gierl et al., 2000; Tatsuoka, 2009)
General Diagnostic Model (GDM)	(von Davier, 2005)

Q-matrix design & analysis

Included: articles that are theoretical (or mostly theoretical) and relate to the creation of a Q-matrix, the analysis and comparison of existing Q-matrices (see sub-themes).

Sub-theme	Citation
Creating a new Q-matrix	(Alavi & Ranjbaran, 2018; Bradshaw et al., 2014; Katz et al., 1998; Khasanova, 2016; Tjoe & de la Torre, 2014)
Q-matrix misspecification	(Hu, Miller, Huggins-Manley, & Chen, 2016; Im & Corter, 2011)
Classification accuracy in Q-matrix design or evaluation	(Cui, Gierl, & Chang, 2012; De La Torre, Hong, & Deng, 2010; M. Gao, 2017; Madison & Bradshaw, 2015; W. Wang, Song, Chen, Meng, & Ding, 2015)
Q-matrix methodology	(Cai, Tu, & Ding, 2018; de la Torre & Chiu, 2016; Ding et al., 2016; Köhn & Chiu, 2017; Terzi & Torre, 2018)

Examples of Q-matrix design studies

Included: studies about constructing or refining a Q-Matrix, i.e. identifying the underlying attributes of the items by exploring the data or by relying on external sources of evidence.

Excluded: studies where the focus was on the test creating/retrofitting itself with little explanation about the Q-Matrix design.

Citations	Domains	Expert judgement	Verbal protocol	Other sources of evidence	Models	Empirical validation	Resulting Q-Matrix	Comments
(Alavi & Ranjbaran, 2018)	Reading comprehension	Yes, 7 content raters.	Yes, 13 students.	Literature search.	Fusion	Yes, no data (N=1986)	9 attributes, 20 items.	This study describes the process of creating a new test
(Close, 2012)	Simulated data, Tatsuoka's dataset, NAEP 8 th grade math test, MDE data	No	No	Principal component analysis to find underlying attributes	DINA, NIDA, RUM	Samples from datasets	Study 2: 6 attributes, 20 items	Innovative method (PCA) to inform Q-matrix design, shows example of identifying attributes through on data mining.
(Jang, 2009)	LanguEdge English L2 reading comprehension test	Yes, 5 raters	Yes (N=11)	Text passage and item analysis	Fusion	Yes, using existing LanguEdge data	3 items, 9 skills	Very detailed section on Q-matrix design, combines multiple sources of evidence.
(Sawaki et al., 2009)	TOEFL	Yes, 6 content experts, 3 if which also TOEFL specialists	No	Domain literature, task analysis	Fusion	Yes, using test data. Experts also evaluated draft Q-matrices.	6 skills for reading section, 4 skills for listening section	Interesting methodology for multiple-draft revision Q-matrix design.
(Buck & Tatsuoka, 1998)	L2 listening comprehension	No (not counting authors as experts)	No (would not be useful for this type of task)	Literature search, task analysis, informal discussions	Rule-space	Yes, using test data from earlier study (N = 412).	15 attributes for 35 items	Very detailed operationalization of the measured ability.

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