


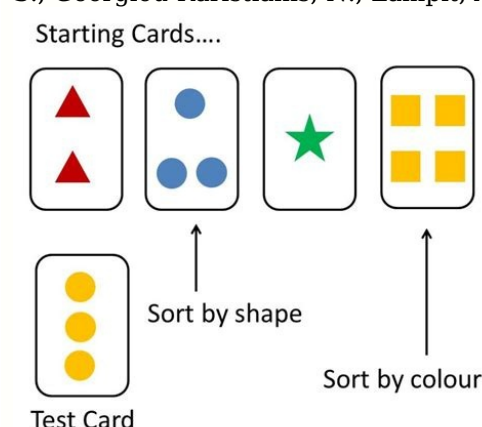
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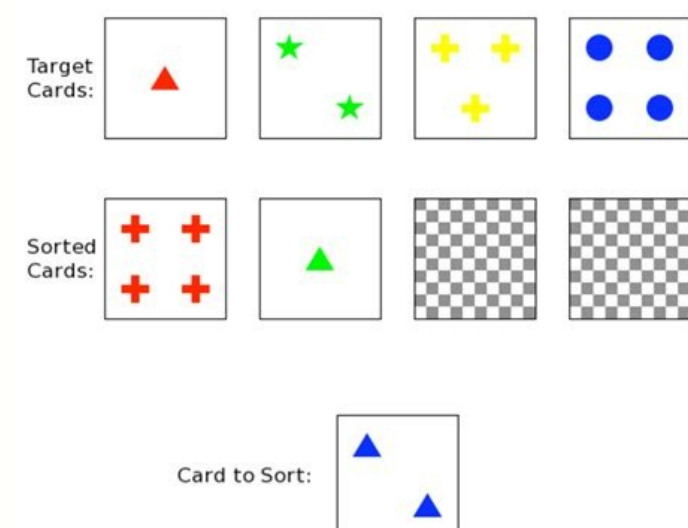
Wisconsin card sorting test explained

How many questions are on the wisconsin cdl test. Wisconsin card sorting test interpretation of scores. Wisconsin card sorting test scoring. Signs of dementia test.

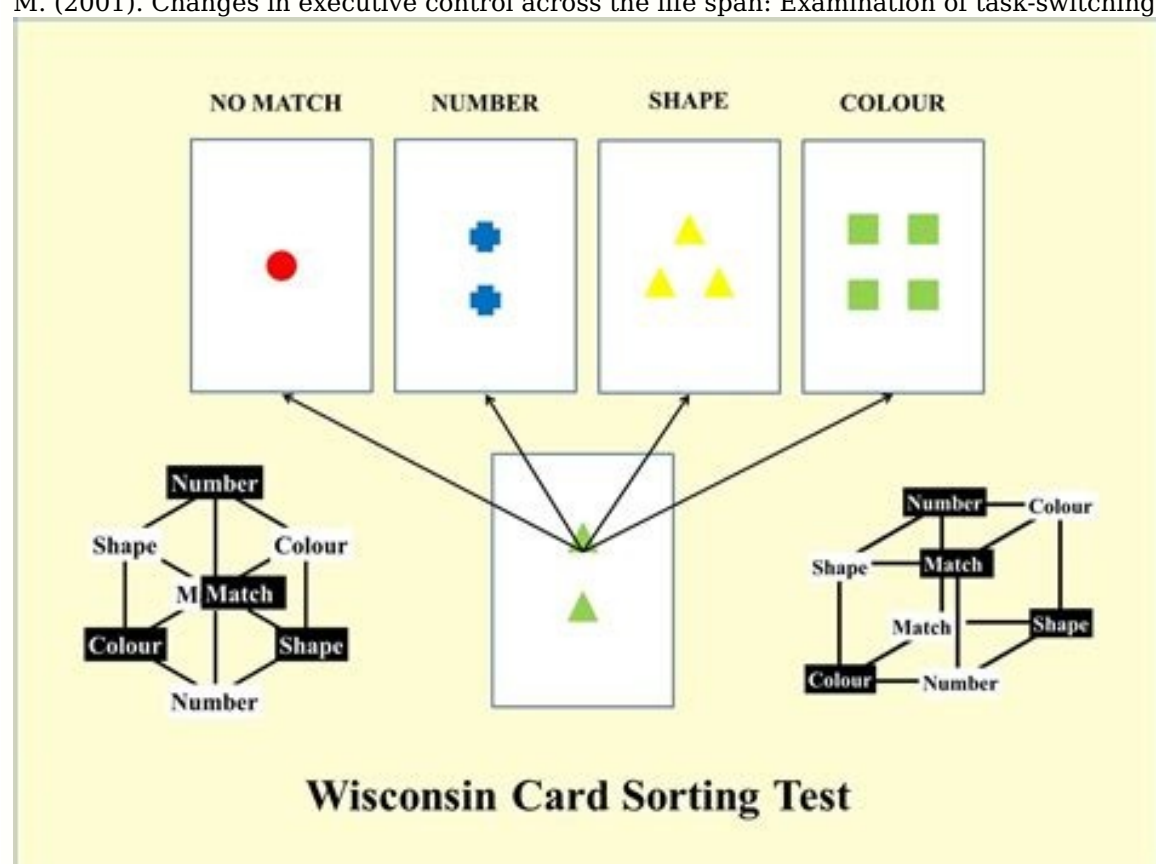
Abbate-Daga, G., Buzzichelli, S., Marzola, E., Amianto, F., & Fassino, S. (2014). Clinical investigation of set-shifting subtypes in anorexia nervosa. *Psychiatry Research*, 219(3), 592-597. M., Rania, M., Caroleo, M., Bruni, A., Palmieri, A., Cauteruccio, M. A., ... Segura-Garcia, C. (2015). Decision making, central coherence and set-shifting: A comparison between binge eating disorder, anorexia nervosa and healthy controls. *BMC Psychiatry*, 15(1), 1-10. Google Scholar Axelrod, B. N., Goldman, R. S., & Woodard, J. L. (1992). Interrater reliability in scoring the Wisconsin Card Sorting Test. *The Clinical Neuropsychologist*, 6(2), 143-155. Article Google Scholar Baker, K. S., Georgiou-Karistianis, N., Lampit, A., Valenzuela, M., Gibson, S. J., & Giummarra, M. J. (2018a). Computerised training improves cognitive performance in chronic pain: A participant-blinded randomised active-controlled trial with remote supervision.



Pain, 159(4), 644-655. PubMed Google Scholar Baker, K. S., Gibson, S. J., Georgiou-Karistianis, N., & Giummarra, M. J. (2018b). Relationship between self-reported cognitive difficulties, objective neuropsychological test performance and psychological distress in chronic pain. *European Journal of Pain*, 22(3), 601-613. PubMed Google Scholar Barceló, F., & Knight, R. T. (2002).



Both random and perseverative errors underlie WCST deficits in prefrontal patients. *Neuropsychologia*, 40(3), 349-356. 0100110-5 Article PubMed Google Scholar Berg, E. A. (1948). A simple objective technique for measuring flexibility in thinking. *The Journal of General Psychology*, 39, 15-22. Article Google Scholar Bilgin, M. (2009). Developing a cognitive flexibility scale: Validity and reliability studies. *Social Behavior and Personality: An International Journal*, 37(3), 343-353. Google Scholar Bischoff-Grethe, A., McCurdy, D., Grenesko-Stevens, E., Irvine, L. E., Wagner, A., Yau, W. Y. W., ... Kaye, W. H. (2013). Altered brain response to reward and punishment in adolescents with anorexia nervosa. *Psychiatry Research - Neuroimaging*, 214(3), 331-340. Google Scholar Buchsbaum, B. R., Greer, S., Chang, W.-L., & Berman, K. F. (2005). Meta-analysis of neuroimaging studies of the Wisconsin Card-Sorting Task and component processes. *Human Brain Mapping*, 25(1), 35-45. PubMed PubMed Central Google Scholar Cepeda, N. J., Kramer, A. F., & Gonzalez de Sather, J. C. M. (2001). Changes in executive control across the life span: Examination of task-switching performance. *Developmental Psychology*, 37(5), 715-730. PubMed Google Scholar Channon, S. (1996). Executive dysfunction in depression: The Wisconsin Card Sorting Test. *Journal of Affective Disorders*, 39(2), 107-114.



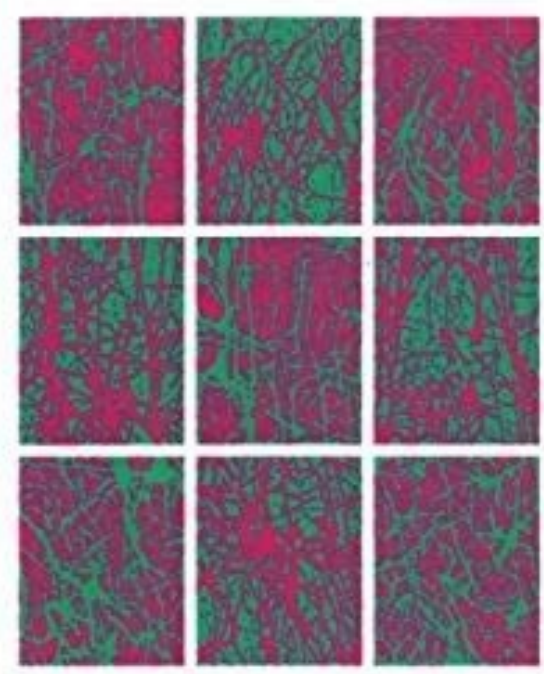
96100027-4 Article PubMed Google Scholar Chaytor, N., Schmitter-Edgecombe, M., & Burr, R. (2006). Improving the ecological validity of executive functioning assessment. *Archives of Clinical Neuropsychology*, 21(3), 217-227. PubMed Google Scholar Cragg, L., & Chevalier, N. (2012). The processes underlying flexibility in childhood. *Quarterly Journal of Experimental Psychology*, 65(2), 209-232. Google Scholar Dajani, D.

Wisconsin Card Sorting Task

- Subjects are asked to sort each upcoming card on to one of the four piles (they are not directed but may use shape, color or number). They are told correct/incorrect. Whichever category they choose is correct for a given number of categories then is met with an "incorrect" response. Subjects must "switch sets" to get a correct response. Failure to switch sets is termed "perseveration".
- Schizophrenic subjects perseverate relative to normal controls, Green et al. 1992

R., & Uddin, L. Q. (2015). Demystifying cognitive flexibility: Implications for clinical and developmental neuroscience. *Trends in Neurosciences*, 38(9), 571-578. PubMed PubMed Central Google Scholar Deák, G. O. (2003). The development of cognitive flexibility and language abilities. *Advances in Child Development and Behavior*, 31, 271-327. 031007-9 Article PubMed Google Scholar Dennis, J. P., & Vander Wal, J.

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S. (2010). The Cognitive Flexibility Inventory: Instrument development and estimates of reliability and validity. *Cognitive Therapy and Research*, 34(3), 241-253. Google Scholar Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64, 135-168. Google Scholar Dickson, K. S., Ciesla, J. A., & Zelic, K. (2017). The role of executive functioning in adolescent rumination and depression. *Cognitive Therapy and Research*, 41(1), 62-72. Google Scholar Eling, P., Derckx, K., & Maes, R. (2008). On the historical and conceptual background of the Wisconsin Card Sorting Test. *Brain and Cognition*, 67(3), 247-253. PubMed Google Scholar Figueroa, I. J., & Youmans, R. J. (2013). Failure to maintain set: A measure of distractibility or cognitive flexibility? *Proceedings of the Human Factors and Ergonomics Society*, 57(1), 828-832. Google Scholar Flashman, L. A., Horner, M. D., & Freides, D. (1991). Note on scoring perseveration on the Wisconsin Card Sorting Test. *The Clinical Neuropsychologist*, 5(2), 190-194. Article Google Scholar Friederich, H.-C., & Herzog, W. (2011). Cognitive-behavioural flexibility in anorexia nervosa. In R. A. H. Adan & W. H. Kaye (Eds.), *Behavioral neurobiology of eating disorders* (Current topics in behavioral neurosciences) (6th ed., pp. 111-123). Berlin: Springer-Verlag. Google Scholar Garcia-Willingham, N. E., Roach, A. R., Kasarskis, E. J., & Segerstrom, S. C. (2018). Self-regulation and executive functioning as related to survival in motor neuron disease: Preliminary findings. *Psychosomatic Medicine*, 80(7), 665-672. PubMed PubMed Central Google Scholar Gelonch, O., Garolera, M., Valls, J., Rosselló, L., & Pifarré, J. (2016). Executive function in fibromyalgia: Comparing subjective and objective measures. *Comprehensive Psychiatry*, 66, 113-122. PubMed Google Scholar Grant, D. A., & Berg, E. A. (1948). A behavioral analysis of degree of reinforcement and ease of shifting to new responses in a Weigl-type card-sorting problem. *Journal of Experimental Psychology*, 38(4), 404-411. Article Google Scholar Greve, K. W. (1993). Can perseverative responses on the Wisconsin Card Sorting Test be scored accurately? *Archives of Clinical Neuropsychology*, 8(6), 511-517. 93190051-2 Article PubMed Google Scholar Greve, K. W. (2001). The WCST-64: A standardized short-form of the Wisconsin Card Sorting Test. *Clinical Neuropsychologist*, 15(2), 228-234. Google Scholar Greve, K. W., Stickler, T. R., Love, J. M., Bianchini, K. J., & Stanford, M. S. (2005). Latent structure of the Wisconsin Card Sorting Test: A confirmatory factor analytic study. *Archives of Clinical Neuropsychology*, 20(3), 355-364. PubMed Google Scholar Heaton, R. K., Chelune, G. J., Talley, J. L., Kay, G. G., & Curtiss, G. (1981). *Wisconsin Card Sorting Test: Manual* (1st ed.). Odessa: Psychological Assessment Resources. Google Scholar Heaton, R. K., & PAR Staff. (2008). *Wisconsin Card Sorting Test: Computer Version 4-Research Edition*. PAR. Herbrich, L. R., Kappel, V., Winter, S. M., & van Noort, B. M. (2019). Executive functioning in adolescent anorexia nervosa: Neuropsychology versus self- and parental-report. *Child Neuropsychology*, 25(6), 816-835. PubMed Google Scholar Johnco, C., Wuthrich, V. M., & Rapee, R. M. (2014). Reliability and validity of two self-report measures of cognitive flexibility. *Psychological Assessment*, 26(4), 1381-1387. PubMed Google Scholar Kortte, K. B., Horner, M. D., & Windham, W. K. (2002). The Trail Making Test, Part B: Cognitive flexibility or ability to

maintain set?

Applied Neuropsychology, 9(2), 106-109. [◆ PubMed](#) [Google Scholar](#) Lie, C.-H., Specht, K., Marshall, J. C., & Fink, G. R. (2006). Using fMRI to decompose the neural processes underlying the Wisconsin Card Sorting Test. *NeuroImage*, 30(3), 1038-1049. [◆ PubMed](#) [Google Scholar](#) McCallum, R. S. (2017). Handbook of nonverbal assessment. [◆ Google Scholar](#) Milner, B. (1963). Effects of different brain lesions on card sorting: The role of the frontal lobes. *Archives of Neurology*, 9(1), 90-100.

[◆ Google Scholar](#) Miyake, A., Emerson, M. J., & Friedman, N. P. (2000). Assessment of executive functions in clinical settings: Problems and recommendations. *Seminars in Speech and Language*, 21(2), 169-183. [Article](#) [Google Scholar](#) Nelson, H. E. (1976). A Modified Card Sorting Test sensitive to frontal lobe defects. *Cortex*, 12(4), 313-324. 76)80035-4 [Article](#) [PubMed](#) [Google Scholar](#) O'Donnell, J. P., Macgregor, L. A., Dabrowski, J. J., Oestreich, J. M., & Romero, J. J. (1994). Construct validity of neuropsychological tests of conceptual and attentional abilities. *Journal of Clinical Psychology*, 50(4), 596-600. 199407)50:4<596::AID-JCLP2270500416>3.0.CO;2-S [Article](#) [PubMed](#) [Google Scholar](#) Øverås, M., Kapstad, H., Brunborg, C., Landrø, N. I., & Lask, B. (2015). Are poor set-shifting abilities associated with a higher frequency of body checking in anorexia nervosa? *Journal of Eating Disorders*, 3(1), 1-9. [◆ Google Scholar](#) Perpiñá, C., Segura, M., & Sanchez-Realés, S. (2017). Cognitive flexibility and decision-making in eating disorders and obesity. *Eating and Weight Disorders*, 22(3), 435-444. [◆ PubMed](#) [Google Scholar](#) Pignatti, R., & Bernasconi, V. (2013). Personality, clinical features, and test instructions can affect executive functions in eating disorders. *Eating Behaviors*, 14(2), 233-236. [◆ PubMed](#) [Google Scholar](#) Rabin, L. A., Barr, W. B., & Burton, L. A. (2005). Assessment practices of clinical neuropsychologists in the United States and Canada: A survey of INS, NAN, and APA Division 40 members. *Archives of Clinical Neuropsychology*, 20(1), 33-65. [◆ PubMed](#) [Google Scholar](#) Reitan, R. M. (1958). Validity of the Trail Making Test as an indicator of organic brain damage. *Perceptual and Motor Skills*, 8, 271-276. [Article](#) [Google Scholar](#) Scott, W. A. (1962). Cognitive complexity and cognitive flexibility. *Sociometry*, 25(4), 405-414. [◆ Google Scholar](#) Specht, K., Lie, C.-H., Shah, N. J., & Fink, G. R. (2009). Disentangling the prefrontal network for rule selection by means of a non-verbal variant of the Wisconsin Card Sorting Test. *Human Brain Mapping*, 30(5), 1734-1743. [◆ PubMed](#) [Google Scholar](#) Strauss, E., Sherman, E. M. S., & Spreen, O. (2006). A compendium of neuropsychological tests: Administration, norms, and commentary (3rd ed.). Oxford University Press. Tchanturia, K., Davies, H., Roberts, M., Harrison, A., Nakazato, M., Schmidt, U., ... Morris, R. (2012). Poor cognitive flexibility in eating disorders: Examining the evidence using the Wisconsin Card Sorting Task. *PLoS ONE*, 7(1), E., & Wade, T. D. (2015). Trail Making Task performance in inpatients with anorexia nervosa and bulimia nervosa. *European Eating Disorders Review*, 23(4), 304-311. [◆ PubMed](#) [Google Scholar](#) Van Autreve, S., De Baene, W., Baeken, C., van Heeringen, C., & Vervaeke, M. (2013). Do restrictive and bingeing/purging subtypes of anorexia nervosa differ on central coherence and set shifting? *European Eating Disorders Review*, 21(4), 308-314. [PubMed](#) [Google Scholar](#) Van Eylen, L., Boets, B., Steyaert, J., Evers, K., Wagemans, J., & Noens, I. (2011). Cognitive flexibility in autism spectrum disorder: Explaining the inconsistencies? *Research in Autism Spectrum Disorders*, 5(4), 1390-1401. [◆ Google Scholar](#) Wollenhaupt, C., Wilke, L., Erim, Y., Rauh, M., Steins-Loeber, S., & Paskalis, G. (2019). The association of leptin secretion with cognitive performance in patients with eating disorders. *Psychiatry Research*, 276, 269-277. [◆ PubMed](#) [Google Scholar](#) Wu, M., Brockmeyer, T., Hartmann, M., Skunde, M., Herzog, W., & Friederich, H.-C. (2014). Set-shifting ability across the spectrum of eating disorders and in overweight and obesity: A systematic review and meta-analysis. *Psychological Medicine*, 44(16), 3365-3385. [◆ PubMed](#) [Google Scholar](#) Yuan, P., & Raz, N. (2014). Prefrontal cortex and executive functions in healthy adults: A meta-analysis of structural neuroimaging studies. *Neuroscience and Biobehavioral Reviews*, 42, 180-192. [◆ PubMed](#) [Google Scholar](#) Zmigrod, L., Rentfrow, P. J., & Robbins, T. W. (2018). Cognitive underpinnings of nationalistic ideology in the context of Brexit. *Proceedings of the National Academy of Sciences of the United States of America*, 115(19), E4532-E4540. [◆ PubMed](#) [PubMed Central](#) [Google Scholar](#) Page 2 From: Considerations for using the Wisconsin Card Sorting Test to assess cognitive flexibility Correct - the response given matches the correct sorting rule Incorrect - the response given does not match the correct sorting rule Correct sorting rule - the dimension that participants are meant to be sorting the cards by, i.e. the rule that is in effect for that category Perseverated-to-principle - the incorrect sorting dimension which a participant is repeatedly responding to (e.g. form, when the correct sorting rule is colour). The perseverated-to-principle applies to only one dimension at a time (i.e. colour or form or number) Perseverative responses - when the dimension the participant is sorting by matches the perseverated-to-principle, i.e. the participant continually responds using an incorrect dimension even after receiving feedback that this response is incorrect. Participants cannot persevereate on the other dimension Non-perseverative responses - when the dimension the participant is using to sort does not match the perseverated-to-principle Ambiguous - when the stimulus card chosen matches the response card on two or more dimensions (e.g. colour and form). By definition, responses that match the other dimension are ambiguous. Figure 1 provides an illustration of a potentially ambiguous response. The response card matches the second stimulus card on both form and number (two stars) Unambiguous - when the stimulus card chosen matches the response card on only one dimension (e.g. colour). Figure 1 provides an illustration of a potentially unambiguous response, in that the response card matches the last stimulus card on colour only (blue)