



# Pediatric Resident Gender, Learning Styles and Temperaments And Their Relationship to Standardized Test Scores

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## PURPOSE

- Board certification is an important professional qualification, a pre-requisite for credentialing and an ACGME component of residency programs' effectiveness.
- Given the increase in female pediatric residents over the past 15 years (60% to 72%), the impact of gender on standardized testing is unknown. Women perform better on the clinical skills exam but men do better on USMLE Step I. As Pediatric Boards strongly emphasize clinical knowledge, it is possible that there may exist a gender bias in the certification process.
- Pediatric residents vary in their learning styles and temperaments but it is unknown what the landscape of these are in pediatric trainees, and if they predict educational success during residency as measured by standardized in-service tests and board scores.
- The purposes of this study were two-fold:
  1. To determine if there is a dominant learning (LS) and temperament style (TS) of pediatric residents and if that differs from the general population; and
  2. To evaluate whether there are relationships among gender, LS and TS and (a) resident in-service examination scores and (b) pediatric board scores.

## METHODS

- From July 2007 to February 2010, three instruments were administered to the residents (n=74):
  1. Keirsey Temperament Sorter (KTS) groups participants into four temperaments (Artisan, Guardian, Idealist and Rational) and 16 sub-types.
  2. Felder-Silverman Learning Style (FSLs)
  3. Kolb Learning Style Inventory (KLSI) categorizes subjects into four styles (Accommodating, Assimilating, Converging and Diverging) based on analysis of four scales: Active Experimentation (AE), Abstract Conceptualization (AC), Concrete Experience (CE) and Reflective Observation (RO).
- 70% completed the KTS, 70% completed the FSLs and 100% the KLSI.
- We correlated these results to pediatric in-service and board scores.

## RESULTS

- For temperament styles (KTS) more residents were Guardians than the general population (61.7% vs. 41%, p<.05) while Artisans were significantly less represented (2% vs. 10%, p<.05).
- For learning styles, the FSLs results were balanced: 52.6% were reflective learners compared to active; 63.2% were sensing compared to intuitive learners; 73.7% were visual compared to verbal learners and 57.9% were sequential compared to global learners (all comparisons=ns).
- For KLSI, residents showed a predominance of converging learning style (49%). Diverging (15%), accommodating (16%) and assimilating (22%) made up the rest. This differed significantly from the general population as well as medical population in general (p<.01). None of these test outcomes varied by gender.
- Residents who were visual learners on the FSLs scored significantly higher on the first/intern year in-training exam (p=.03), but learners categorized as verbal performed significantly better on the ABP certification examination (p=.03). All other analyses revealed no associations.
- There was no relationship between KTS and test scores.
- Among learning styles, there was little variation in the in-training examination performance until the PL3 examination. Convergers performed better on both the PL3 ITE and the ABP certification examination (p=ns).

Figure 1. Comparison of Pediatric Resident Temperaments to the General Population.

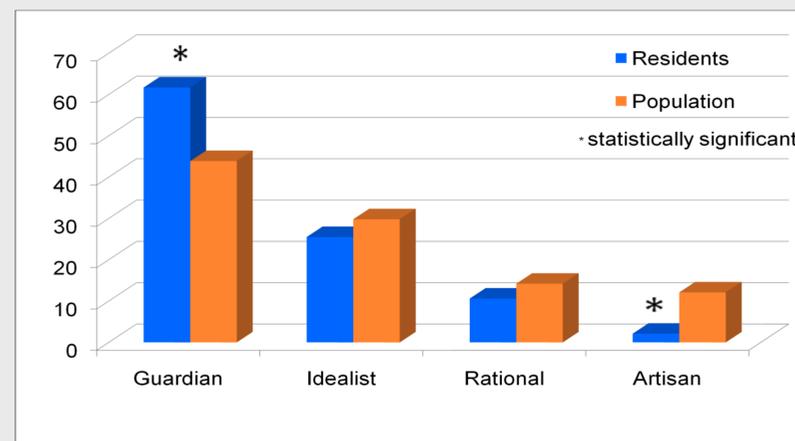


Figure 2. Comparison of Pediatric Resident Learning Styles with the Medical and General Populations.

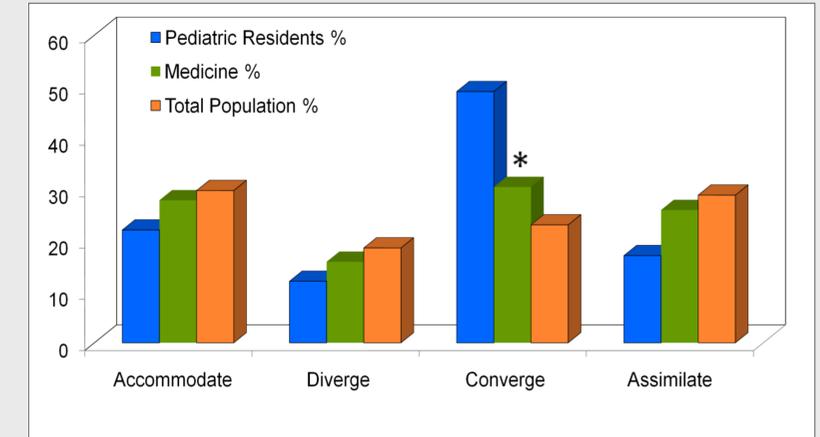
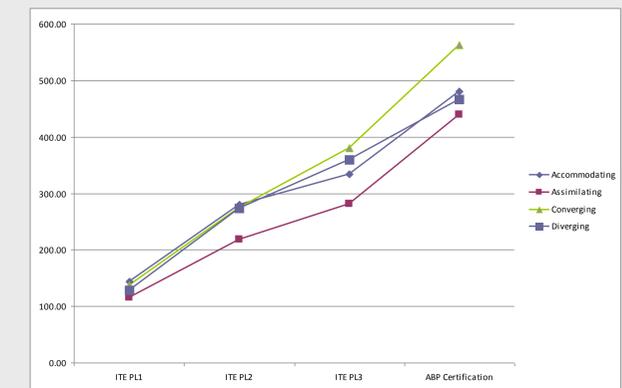


Figure 3. Comparison of Pediatric Resident Learning Styles to In-Service and Board Scores.



## CONCLUSIONS

- Since residents vary greatly in their learning and temperament styles, medical educators have a responsibility to offer a variety of educational opportunities to enhance resident learning. Divergers and assimilators, for example, may be at greater risk for performing poorly on in-service and board examinations. There is no relationship between gender and in-service or board scores.
- Convergers did best on standardized tests but as the majority of pediatricians are Convergers, it is possible that tests are created by and therefore biased towards Convergers.
- Larger, multi-center studies may be needed to evaluate statistical significance for relationships that showed trends but did not reach statistical significance.