Problems with Child and Adolescent Normative Reference Data for the Rorschach Comprehensive System (CS) and the Initial Solution Adopted by R-PAS® for Profiling CS Records

Description of the R-PAS Child and Adolescent Norms

Brief and Non-Technical Summary

The Problem for CS Users: Since 2007, it has been clear that there are problems with the Comprehensive System (CS) normative data for children (Shaffer, Erdberg, & Meyer, 2007) and these problems will extend to any CS administered or CS scored protocols that are profiled in the R-PAS scoring program. One problem is that the existing CS norms (Exner, 2003) make contemporary samples of children look unhealthy, often dramatically so. Adult data are similar in showing the same pattern of deviations across scores, although with adults the differences between the CS norms and other samples from the U.S. and abroad are not as extreme as they are with children (Meyer, Erdberg, & Shaffer, 2007; Viglione & Hilsenroth, 2001; Viglione & Meyer, 2008; Wood, Nezworski, Garb, & Lilienfeld, 2001). The second problem with the CS norms is that among recently collected samples of children a number of scores show wide variability across samples of similar ages. This is in contrast to the CS normative data for adults, where scores are cohesive across samples from many different cultures and countries.

The Best Solution for CS Users. Obviously, these two problems make it difficult to use the CS with children and adolescents. To overcome these difficulties, we recommend switching to R-PAS administration and scoring. The R-PAS norms for children and adolescents correct for the problems that had been observed with CS norms and using R-PAS with children and adolescents provides all the other benefits of using R-PAS rather than the CS, including more thorough guidelines for administration and coding, better reliability, use of variables with a stronger research foundation (including variables not found in the CS), easy to understand visual profiles of results, and more transparent interpretation of variables, among others.

The Solution for User's Wishing to Profile CS Protocols in R-PAS. For users who wish to profile CS administered or CS scored protocols using the R-PAS scoring program, we have made available a conservative mechanism to use the most recent CS nonpatient data for children and adolescents summarized by Meyer, Erdberg, and Shaffer (2007). These samples are organized into three broad age ranges (5-8, 9-12, and 13-18). We also encourage users working with CS data to follow the interpretive guidelines recommended in that article, which also were illustrated further by Tibon and Rothschild (2009).

Briefly, this is how the solution works to profile CS data in R-PAS. When entering a CS protocol in our online scoring program for a child or adolescent, the user selects the appropriate age category and then enters all the response codes. Scores are then computed just as they are for standard R-PAS protocols. These scores are subsequently plotted on the standard Profile Pages using adult normative transformations. (Example output is included below in the Background and Technical Rationale section.) However, whenever possible the plotted scores are accompanied by a visual overlay that shows where *children of that age* are expected to fall. That is, the overlay shows what is normative for a child of that developmental level.

The expected range of scores is determined in two ways, depending on how cohesive the CS norms are. For scores that have cohesive CS norms across different samples of children, the expected range is determined by the mean for that age in addition to "whiskers" (dotted lines) that extend one standard deviation below and above it (to the left and right of the X that marks the child mean). For the handful of scores that are not cohesive in the CS norms, the expected range is wider. It is determined not by the overall average score but by the lowest and highest mean score observed across the different CS nonpatient samples for that age (indicated by slashes at some distance from the mean), as well as by the whiskers that extend one standard deviation beyond those points.

Interpreting the results for CS protocols. For either kind of overlay, when a score falls outside the range defined by the whiskers of dotted lines, it is considered an atypical deviation from what is expected for a child of that age and thus likely to be clinically meaningful. The value of plotting data this way is that it simultaneously allows the clinician to see what is typical or atypical for a child of a particular age and also to see how children at that age differ from adults on that particular characteristic.

Background and Technical Rationale for the Initial R-PAS Solution to the Problems with Child and Adolescent Normative Reference Data for Profiling CS Records

Many clinicians rely on the Rorschach as an assessment tool for use with children and adolescents. As a standardized behavioral task that does not require the respondent to engage in conscious self-reflection or a comparative evaluation of self-versus-other, it is an ideal tool for this purpose in many ways. Unfortunately, since the *Journal of Personality Assessment Special Supplement on International Reference Samples for the Rorschach Comprehensive System* was published (Shaffer, Erdberg, & Meyer, 2007), it has been clear that there are two problems with the CS normative data for children. By extension, the same two problems currently affect any CS protocols that are profiled in R-PAS.

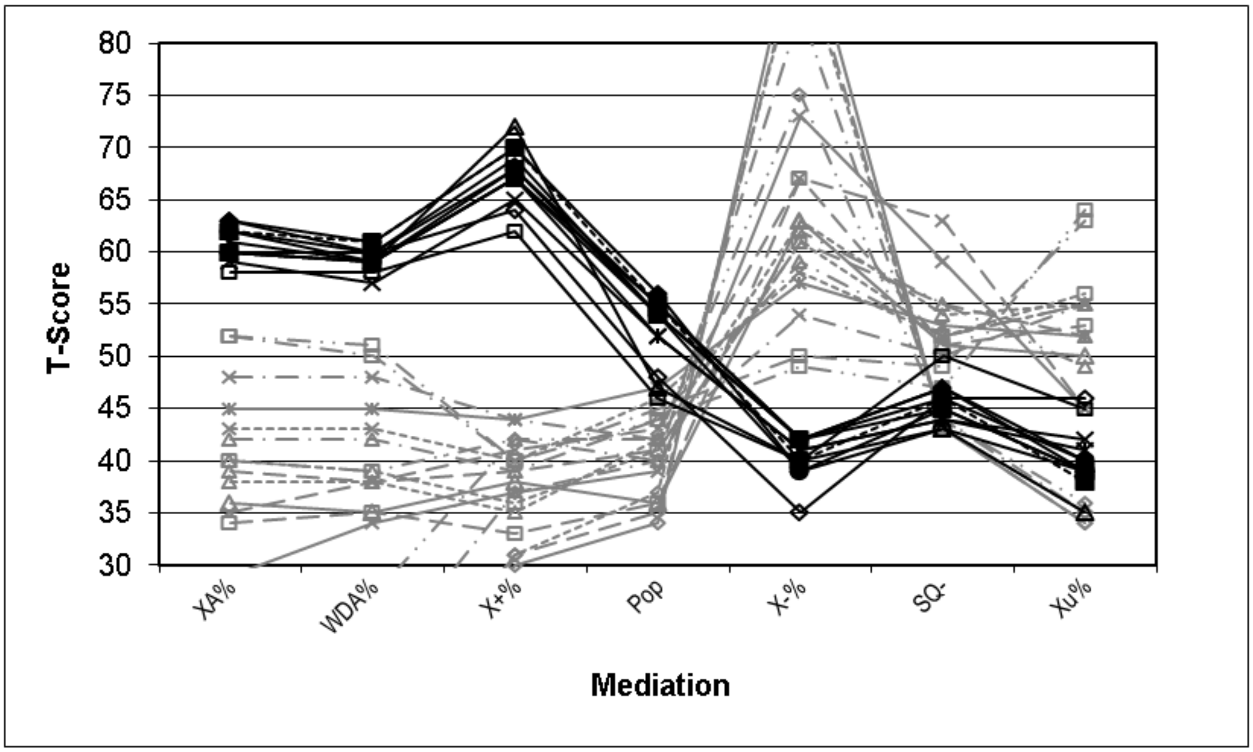
Problem #1 - Discrepancy Between Official CS Norms and Research Findings.

The first problem is that the most recently collected CS normative data for children and adolescents look notably different from the normative data for children and adolescents that Exner collected about 30 years ago. In a final paper for the *Supplement*, Meyer, Erdberg, and Shaffer (2007) summarized data from 31 child and adolescent samples. [You may request a copy of this article for personal use by clicking this link.] These data included all 19 of the samples presented in the *Supplement*, as well as 12 samples that had been collected by Exner (2003) 30 years ago or more. The composite of data drew on 2,647 protocols from five countries that included Denmark (Hansen, 2007), Italy (Lis, Salcuni, & Parolin, 2007; Salcuni, Lis, Parolin, & Mazzeschi, 2007), Japan (Matsumoto, Suzuki, Shirai, & Nakabayashi, 2007), Portugal (Silva & Dias, 2007), and the U.S. (Exner, 2003; Hamel & Shaffer, 2007; Valentino, Shaffer, Erdberg, & Figueroa, 2007; Van Patten, Shaffer, Erdberg, & Canfield, 2007).

The consolidated CS results for children and adolescents are summarized in Figures 3, 4, and 5 and in Table 5 of the Meyer et al. article. In all of these figures, the different samples of children and adolescents were compared to adult standards. Specifically, mean scores for each age or age range were converted to T-Scores, with the T-Scores indicating how far the youth fell above or below that which was expected in adulthood. Profiling the data this way provided a uniform standard of comparison across samples and also allowed any developmental progressions that were present in the CS data to be more evident. (As a reminder, T-Scores are formed by scaling a variable so that its mean is set at a value of 50 and its standard deviation is equal to 10. Given this, a T-Score of 60 is 1 SD above the mean, a T-Score of 70 is 2 SDs above the mean, and so on.)

The findings in Figures 4 and 5 of Meyer et al. (2007) revealed that the more recently collected samples of children and adolescents looked quite different from the published CS norms for children and adolescents on many variables. In particular, the official CS norms generally looked healthier, more complex, and more resourceful than any of the recently collected samples of youngsters. The upshot then was that relative to the official CS norms, the newer samples of nonpatient youngsters looked substantially more disturbed than expected. This was particularly the case for variables related to perceptual accuracy, human representations, and general richness and complexity. Importantly, with adults one saw the same pattern of differences on these scores when comparing the CS norms to other nonpatient samples collected in the U.S. or from other countries. However, with adults the differences were not as notable and dramatic as they were with children (Meyer, 2001; Meyer et al., 2007; Viglione & Hilsenroth, 2001; Viglione & Meyer, 2008; Wood et al., 2001).

The graph below was subsequently published as part of Figure 4 in Meyer et al. (2007), and it illustrates the issue using variables in the CS Mediation cluster. The graph plots all the child CS samples, with each line representing the T-Score values for a specific sample. The dark lines are the Exner-collected CS normative samples; the light lines are the more recently collected CS samples from the U.S. and other countries. The standard for adults is set at the T-Score line of 50; that is what is average or expected for an adult. Across the variables in this figure a very clear pattern of results is evident. The dark lines for the Exner-collected normative CS samples of youth at various ages look like they have healthier perception than adults (e.g., most T-scores for XA%, WDA%, and X+% are high, being at or above 60) and the light lines for the contemporary CS samples of youth look like they have more impaired perception than adults (e.g., most T-scores for XA%, WDA%, and X+% are very low, being at or below 40).



To have a clear understanding of this figure, consider the X+% variable as an example. Its mean raw score value for non-patient adults is .52 with a standard deviation of .13. These values are used to establish the T-Score values for the other samples that are plotted. Thus, a T-Score of 50 reflects the mean value (.52) and a T-Score of 60 reflects a score that is 1 SD above the mean value (i.e., .52 + .13 = .65). (Note that we are using the variable name found in the figure. In R-PAS, X+% is named FQo%. Also, all Form Quality percentages referenced here are based on the CS Form Quality tables.)

The mean raw score value for X+% across all 12 of the Exner-collected CS samples of children and adolescents is .75. This value is roughly 1.8 SDs above the raw adult nonpatient mean of .52. As such, on the T-Score metric this value also would be located 1.8 SDs above the mean, which equates to an elevation of 18 points above the mean of 50, or a T-Score value of 68. Locating this mean T-Score value on the figure, one can also see that the 12 CS normative samples designated by the dark lines have relatively little variability around this average value. The lowest T-Score for X+% in the Exner-collected child samples is 62 and the highest is 72. Importantly, although this is not readily evident from the figure, the variability that is present is not strongly related to age, which is a pattern of findings that is at odds with a substantial amount of other developmental research (e.g., Ames, Métraux, & Walker, 1952; Stanfill, Viglione, & Resende, 2011).

Turning attention next to the more recently collected CS samples of youth, it can be seen that all of the gray lines are much lower, with T-Scores that range from a low of 30 to a high of 44. Moreover, although it is not easily discerned from the graph, these samples do show an age-based developmental progression, such that perception becomes more conventional and adult-like as children age.

To illustrate these points about developmental changes, we summarize the data in a tabular format as a function of three different age groups. In Table 1 the more recent child and adolescent samples of CS nonpatient records from the *Supplement* are contrasted to the older CS norms, last published by Exner in 2003 but collected much earlier. In addition to raw scores, the T-Score equivalents are presented to help show where the raw score values would fall on the graph given above.

Table 1. Mean X+% (FQo%) Values by Age Group and by CS Normative Reference Sample

	Raw Scores		**T-Score Equivalents**	
Age Range	**Older CS Norms**	**Newer Samples**	**Older CS Norms**	**Newer Samples**
5 to 8	.72	.32	66	35
9 to 12	.75	.37	68	39
13 to 18	.76	.41	69	42

Note the implications of these data. The older CS norms suggest that children should have conventional perceptions as defined by X+% that are 1.5 to 2.0 SDs **above** what is average for contemporary adults (i.e., T-Scores between 65 and 70), but in reality contemporary nonpatient samples of children have conventional perceptions that are about 1.0 to 1.5 SD **below** what is average for adults (i.e., T-Scores between 35 and 40). These are dramatically different CS benchmarks for understanding what is typical or normal for children and adolescents.

The same kind of pattern can be seen with the X-% variable (FQ-% in R-PAS), though some of the results are even more striking. As can be seen in Table 2 below, in the official CS norms, children have minimal variability in raw X-% values as a function of age, though there are marked developmental differences in the newer samples. And again, the older norms and newer CS samples provide drastically different expectations for how much perceptual lapse or distortion one should expect to see in nonpatient children. For those familiar with standard CS interpretive benchmarks it should be obvious that for the newer CS samples all of the X+% values in Table 1 (.32, .37, and .41) and X-% values in Table 2 (.44, .38, and .27) are in an interpretive range that would suggest a youth who is highly disturbed, if not psychotic. Thus, the older standards make nonpatient children look quite aberrant.

Table 2. Mean X-% (FQ-%) Values by Age Group and by CS Normative Reference Sample

	Raw Scores		**T-Score Equivalents**	
Age Range	**Older CS Norms**	**Newer Samples**	**Older CS Norms**	**Newer Samples**
5 to 8	.07	.44	39	73
9 to 12	.09	.38	41	67
13 to 18	.09	.27	41	57

These patterns are not limited to the variables in the CS Mediation cluster. Rather, they affect many other types of scores. Below are two tables illustrating the differences between the older CS standards and what is seen in the newer CS samples of nonpatient children from the *Supplement*. Table 3 provides results for the combination of Human Movement with the Weighted Sum of Color (called EA in the CS, MC in R-PAS) as a measure of general resources. Table 4 gives the results for the Human Representation Variable (HRV), which in the CS was computed as the number of Good Human Representations minus Poor Human Representations (i.e., GHR – PHR).

Table 3. Mean EA (MC) Values by Age Group and by CS Normative Reference Sample

	Raw Scores		T-Score Equivalents	
Age Range	**Older CS Norms**	**Newer Samples**	**Older CS Norms**	**Newer Samples**
5 to 8	6.8	3.3	50	41
9 to 12	8.4	4.5	54	44
13 to 18	8.6	5.6	55	47

Table 4. Mean HRV Values by Age Group and by CS Normative Reference Sample

	Raw Scores		T-Score Equivalents	
Age Range	**Older CS Norms**	**Newer Samples**	**Older CS Norms**	**Newer Samples**
5 to 8	2.9	-0.9	56	44
9 to 12	3.9	-0.6	60	45
13 to 18	3.8	0.4	60	48

As a result of these kinds of differences, it can be seen that the official CS norms for children cannot be used to guide inferences in applied practice about what is typical or expected for nonpatients. The older CS norms provide an overly healthy standard of comparison that serves to make nonpatient children assessed today look like they have distorted perceptions, limited resources, excessive simplicity, problematic interpersonal representations, and an absence of affectional needs, among others. R-PAS norms, in contrast, to not make contemporary nonpatient samples of children and adolescents look unhealthy. They also appropriately capture developmental maturation across ages.

Problem #2 – Excessive Variability in Some Scores among CS Normative Reference Samples

The second problem that exists with CS normative reference data is variability in the newer samples of youngsters. The newer CS samples collected from various countries around the world look different from each other on some key variables, particularly Lambda/Form% and Form Quality. Even among samples collected within the same country there can be a significant amount of variation. This finding is in contrast to the adult CS international reference data, which are notably more cohesive. The variability in samples can be seen most readily by turning to the Meyer et al. (2007) article and contrasting Figures 3 and 4 for children and adolescents with Figures 1 and 2 for adults. The variability also can be seen in the figure presented above, where for instance the X-% values fan out across the CS samples beyond what would be accounted for by age differences. After reviewing the findings, Meyer et al. concluded that 35 of 143 CS structural summary variables had so much variation across samples that it was not feasible to rely on a single normative reference value to guide interpretation. Instead, when interpreting these 35 scores it would be necessary to build wider confidence intervals or wider ranges of what is considered typical or expected in order to take into account the degree of variability seen across the different CS nonpatient samples.

The result of these two problems – the older official CS norms being at odds with newer CS samples and excessive variability for some scores within the newer CS samples – is that at present there are not good normative data to guide interpretation for children and adolescents across all CS variables. This also is true for CS records that a user might want to profile in R-PAS.

The Solutions for Obtaining Child and Adolescent Norms

Obviously, these two problems make it difficult to use the CS with children. To overcome these difficulties, we recommend switching to R-PAS administration and scoring as the best option for using the Rorschach with children and adolescents. The R-PAS norms for children and adolescents correct the problems that had been observed with the CS norms. Further, using R-PAS with children and adolescents provides all the other benefits of using R-PAS rather than the CS, including more thorough guidelines for administration and coding, better reliability, use of variables with a stronger research foundation (including variables not found in the CS), easy to understand visual profiles of results, and more transparent interpretation of variables, among others.

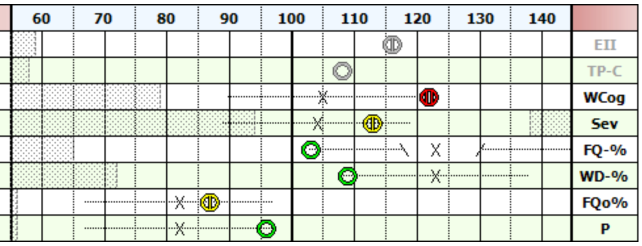
At the same time, we recognize that some users may have CS records that they would like profiled in R-PAS. To accommodate this, we use an approach that follows the guidelines recommended by Meyer et al. (2007, p. S213), which were illustrated further by Tibon and Rothschild (2009). Specifically, like in Table 5 from Meyer et al., we use the data reported in the *Supplement* to generate three sets of age-based normative expectations. These norms basically cover the age ranges from 5 to 8, 9 to 12, and 13 to 18. Although these age bands are fairly wide, existing CS data do not permit finer developmental discriminations. We made one change relative to data in Table 5 of Meyer et al., which is that we omitted the samples that had been collected in Japan. In an effort to increase scoring reliability for Form Quality, these authors did not extrapolate from the Form Quality tables. Instead they coded all responses that were not directly listed in the table as FQ-. This nonstandard procedure contributed to notable deviations in all the FQ related variables.

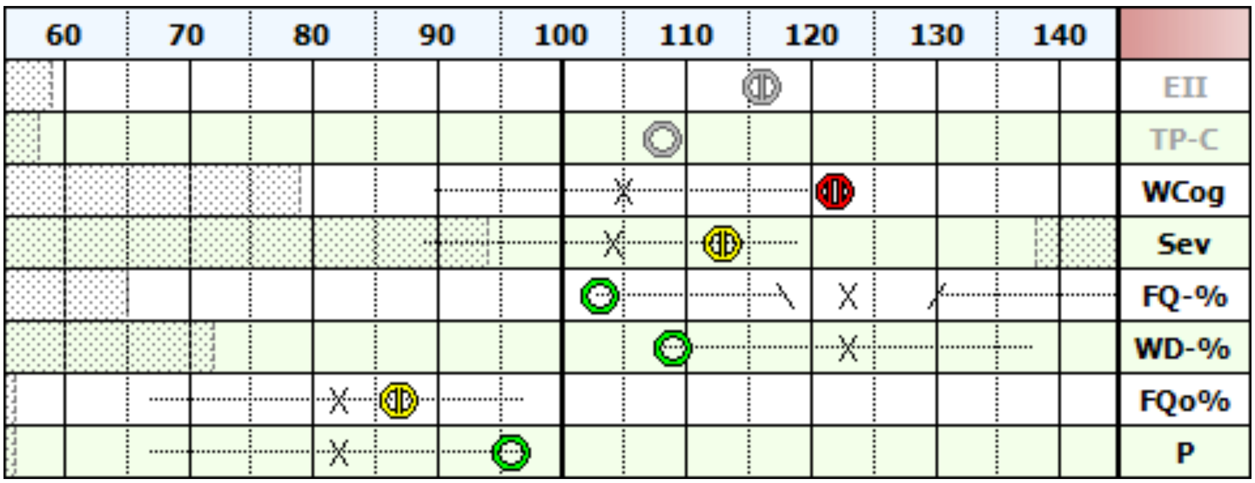
To facilitate interpretation of a CS protocol, the R-PAS online scoring program produces an age-based interpretive overlay that accompanies the standard adult R-PAS profile pages. The overlay shows visually the range where one would expect nonpatient children of a particular age to score. For all variables that Meyer et al. (2007) considered reasonably cohesive across CS samples we use the age-specific mean value plus or minus 15 Standard Score points (conceptually equivalent to ±1 SD) to designate the expected normative range. Specifically, we take the observed age-specific mean value and convert it to its percentile equivalent using the adult normative reference data. The percentile is then converted to its Standard Score equivalent, to which we add a range of ±15 points to designate the broad average range for a child of that age. For those variables that are not reasonably cohesive across CS samples, we plot the range between the minimum mean value and the maximum mean value and then plot the expected broad average range around these anchors, extending 15 Standard Score points below the minimum mean and 15 Standard Score points above the maximum mean. In both instances, it is conservative to plot a range of 30 or more points to designate what is the expected normative range for a CS protocol. Nonetheless, clinicians can be confident that observed scores that fall outside of the plotted range for that age are atypical.

Understanding the Output for CS Child and Adolescent Protocols that are Profiled in R-PAS

Below is a case illustration of the interpretive overlays for CS protocol. The image is from the Perception and Thinking Problems section of the Page 1 Profile using the CS tables to score Form Quality variables. The first image shows the full section; the second focuses on just the profile graph, which is the standard profile used for adults. As a brief orientation to the profile, the round icons indicate the client's observed scores relative to the adult normative data using the Standard Score interpretive metric, with a mean of 100 and SD of 15. (R-PAS converts raw scores to percentiles and then to Standard Score equivalents rather than using the T-Scores that were reported in the Meyer et al. [2007] article referred to above.) To help visually discriminate the location of scores on the profile, an open green icon is used for scores that fall in the Standard Score range from 90 to 110; a yellow icon with one bar is used for scores that fall in the range from 80 to 89 or 111 to 120; a red icon with two bars indicates a score that falls in the range from 70 to 79 or 121 to 130; and a filled black icon is used to designate scores that fall below 70 or above 130. The hatching that is visible at some of the outside edges designates the lowest and highest values found in the CS normative data used by R-PAS (e.g., the lowest value for the SevCog code is zero and it is associated with a Standard Score equivalent of 94).

Perception and Thinking Problems						
EII-3		0.8	85	116	83	114
TP-Comp (Thought & Percept. Com...)		1.0	71	108	71	108
WSumCog		20	93	122	92	121
SevCog		1	80	113	80	113
FQ-%	CS FQ	20%	59	103	56	102
WD-%	CS FQ	20%	72	109	72	109
FQo%	CS FQ	40%	20	87	20	87
P		5	39	96	43	97





Also illustrated on the profile graph is a visual overlay that shows what would be expected for a 5 to 8 year old child. If the score is reasonably stable across CS samples (e.g., WSumCog and SevCog) the mean for a child of this age is plotted as an X with "whiskers" (the dotted lines) that extend 15 points above it to the right and below it to the left. For example, the mean value for WSumCog (WSum6 in the CS) at this age is 8.4, which is a bit above average for an adult and corresponds to a percentile of 63 and thus a Standard Score equivalent of 105. This mean value is marked on the profile by an X at 105 and the broad expected normative range around it is designated by the whiskers or dotted lines that extend from 90 to 120.

If a score is not reasonably stable (e.g., FQ-%), the mean value across CS samples is still plotted with an X. However, the plot now also shows markers that designate the lowest mean observed across CS samples (\) and the highest mean across CS samples (/), followed by whiskers that extend 15 points below the lowest mean and 15 points above the highest mean. Thus, the broad normative range for FQ-% is larger than 30 points to take into account the extra degree of variability seen across nonpatient CS samples of children at this age.

With both the stable and unstable variables, if a score falls outside the whiskers (outside the range of the dotted lines) it would be considered a notable deviation from what was expected for a child of this age and thus clinically interpretable as atypical or exceptional. Of course, a score that falls within the whiskers may reflect a personal strength or an expression of normality, so that all scores can help in understanding a child, not just the deviant ones.

Note that interpreting the results for a child or adolescent is a bit more complicated than for an adult. This is because the expected value is no longer necessarily set at 100, the midpoint of the profile. In turn this means that one cannot automatically interpret a score using conventional Standard Score benchmarks; a value of 110 or 115 may in fact be below average for a child of that age rather than above average as it would be for an adult (e.g., as it is in the figure for WD-%). In part the data are profiled this way so that developmental progressions are obvious. In part they are profiled this way because the available CS data did not allow us to create age-specific norms for those who want to profile CS protocols on the R-PAS system. Users who want age-specific norms should switch to R-PAS.

Returning to the figure it can also be seen that some scores are grayed out (e.g., EII-3 and TP-Comp). These are scores for which the CS samples published in the *Supplement* did not provide some data that could serve as normative guides. This includes all the variables that are new to R-PAS and not part of the CS. The R-PAS program computes and displays these scores, but they are grayed out so as not to be visually salient in the profile.

When interpreting a CS protocol for children or adolescents using the R-PAS system, the user has to ignore the color and shape of the icon. Those colors and shapes are tied to the underlying normative grid, which is based on adult data, not to the overlays, which are based on CS child and adolescent data. With this in mind, the example output shows that this child's observed scores are in line with what could be expected for a child of his age, with the exception of WSumCog, which is a measure of cognitive disorganization. For a child in the 5 to 8 age range, on average we expect to see a bit more frequent lapses in thinking or reasoning than is typical for an adult (i.e., expected mean = 105), and so we expect that most children will have Standard Scores that fall in a broad average range between 90 and 120. This child has a raw score of 20 (as is visible in the second column of the smaller profile) which equates to an adult Standard Score equivalent of 122 on the grid. However, the color and placement of the icon on the grid, as well as its reported value of 122 has to be ignored. All that is important is where the icon is in relation to the overlay that is superimposed on the grid. Based on this, we can see that it is slightly more than would typically be expected at this age because it falls beyond the maximum of 120 defining the broad normative range. Thus, this child is prone to more disorganization in thinking and lapses in logic than is typical for other 5 to 8 year olds. It is also worth noting a general trend in the data for values that are within normative expectations. Importantly, this child's perceptual accuracy tends to be better than expected for his age. Both FQ-% and WD-% provide assessments of perceptual distortions and looking at the overlays it can be seen that his scores are at the lower boundary of what is average, indicating less perceptual distortion than is typical for his age. Similarly, P is a measure of conventionality in perception and we see from the overlays that his score falls at the upper end of what is typical for a child of this age, suggesting he is adept at perceiving what is most conventional or obvious. Thus, overall, for a child of his age, we see some disarray and slippage in thinking but a good ability to perceive the environment realistically.

The Future

We believe it might be valuable for users to have some ability to profile on the R-PAS system older CS records from children and adolescents, even if the solution we provide is incomplete. The method described here makes conservative use of the existing CS data to correct as much as possible the two problems that were evident in the CS norms for children and adolescents. However, for all the reasons we describe in our manual, our training materials, and in our publications, we discourage users from continuing to use the CS in practice. Instead, we recommend conversion to R-PAS for applied use of the Rorschach across all ages.

Although it is not fully clear what factors contributed to variability that was seen in the CS normative data for children and adolescents, we believe that improving guidelines for test administration, response clarification, and coding as has been done in R-PAS helps to reduce unwanted variability across examiners. We also believe that new R-PAS features, including R-Optimized administration procedures and detailed steps about how to clarify responses, helps to reduce unwanted variability in children's Rorschach protocols and helps to ensure the current R-PAS norms for children and adolescents provide more optimal normative values.

Our work collecting additional reference data for children and adolescents is ongoing and we are interested in partnering with people who might be able to collect such data from their country or region, even if it might be just a small sample. If you are interested in exploring this possibility with us, please visit the Help with Normative Data Collection link on your R-PAS control panel for more information.

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