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STATE OF CONNECTICUT v. CYRUS GRIFFIN
(SC 17052)

Borden, Norcott, Katz, Palmer and Zarella, Js.

Argued October 19, 2004—officially released April 5, 2005

Moira L. Buckley, for the appellant (defendant).

Christopher T. Godialis, assistant state's attorney,
with whom, on the brief, was *Michael Dearington*,
state's attorney, for the appellee (state).

Opinion

PALMER, J. A jury found the defendant, Cyrus Griffin, guilty of manslaughter in the first degree with a firearm in violation of General Statutes § 53a-55a (a)¹ and carrying a pistol without a permit in violation of General Statutes § 29-35.² The trial court rendered judgment³ in accordance with the jury verdict, from which the defendant appealed to the Appellate Court, claiming, inter alia, that the trial court improperly had excluded certain expert testimony during the hearing on the defendant's motion to suppress his oral confession to the police following his arrest.⁴ The Appellate Court rejected the defendant's claim; *State v. Griffin*, 77 Conn. App. 424, 428, 823 A.2d 419 (2003); and we granted the defendant's petition for certification to appeal limited to that issue. *State v. Griffin*, 265 Conn. 910, 831 A.2d 252 (2003). We affirm the judgment of the Appellate Court.

The opinion of the Appellate Court sets forth the following facts that the jury reasonably could have found. "At or around 2 p.m. on January 29, 1998, Denard Lester, accompanied by the defendant, robbed the eighteen year old victim, Tyshan Allbrooks, in New Haven. Lester took from the victim what witnesses described as a necklace or a medallion made of gold. The victim immediately went to a friend's nearby house, reported the incident to the police and, during an interview, provided a statement to the police who had responded to her complaint. After the robbery, the defendant, Lester and Tobias Greene were passengers in an automobile being operated by Paul Little. The defendant and Lester were fourteen years of age; Greene and Little were sixteen years of age.

"A short time later, at or around 2:45 p.m., the victim was walking along Whalley Avenue in New Haven when she was seen by the defendant, who was in the automobile with his acquaintances and was aware that the victim had reported the robbery to the police. The defendant remarked that 'snitches get stitches,' got out of the automobile and chased the victim on foot. The victim ran [into] a convenience store where she asked an attendant to call for assistance. The defendant caught up to the victim, and shot her twice in the chest and four times in the back with his pistol, thereby causing her death." *State v. Griffin*, supra, 77 Conn. App. 427.

The Appellate Court opinion also sets forth the following additional relevant facts and procedural history. "Prior to trial, on April 5, 1999, the defendant filed a motion to suppress 'potential testimony and other evidence of any statements made by the [d]efendant.' It is not contradicted that, on February 2, 1998, police detectives arrested the defendant in an apartment in New Haven after they [had] discovered him hiding in

a closet. The police thereafter took the defendant to the New Haven police department where Detectives Leroy Dease and Gilbert Burton interviewed him. At trial, Dease testified that the defendant told him that Lester had taken the victim's necklace from her and that after the robbery, the defendant, Lester, Greene and Little drove around New Haven. Dease further testified that the defendant told him that Greene, upon observing the victim walking across an intersection, [had] ordered [the defendant] to get out of the car and shoot the victim. Dease then testified that the defendant confessed that he [had] followed the victim [into] the convenience store and, with Greene standing nearby, 'pulled out his small pistol and shot [the victim] several times.' According to Dease, the defendant also told him that he was afraid that Greene was going to shoot him and believed that Greene had ordered him to shoot the victim because [the defendant] owed Greene \$300. Burton testified that he was present during the defendant's arrest and interview, and testified as to the circumstances under which the defendant [had] made his confession.

"The defendant supported his motion to suppress by asserting [inter alia] that he had made the statements, in which he confessed to having shot the victim . . . involuntarily in violation of his due process rights" *Id.*, 427-28.

"On April 19, 2001, prior to the hearing on the defendant's motion to suppress, the state filed a motion in limine to exclude 'any and all opinion testimony of any expert witness regarding the waiver of *Miranda*'s rights predicated upon an evaluative protocol created by Thomas Grisso or related to such protocol.' The state argued that such evidence was based on 'scientific, technical and/or specialized knowledge which is unreliable.'

"At the evidentiary hearing on the defendant's motion to suppress . . . the defendant elicited testimony from Madelon V. Baranoski, a clinical psychologist employed by the Connecticut Mental Health Center at Yale University [School of Medicine]. Baranoski . . . is an associate clinical professor at Yale [University School of Medicine] and the associate director of the [New Haven] court clinic, which is affiliated with the law and psychiatry division of [the] department of psychiatry [of the school of medicine]. Baranoski testified that as part of her professional duties, she evaluates approximately 200 separate defendants in an average year to [determine] whether they are competent to stand trial.

"Baranoski testified that evaluating an individual's competency in regard to a particular stage of trial proceedings involves identifying what tasks are involved at such stage of the proceedings . . . and determining whether the individual possesses the competency to understand the issues and tasks related thereto. [Bar-

noski] testified that she evaluated the defendant to determine whether he possessed the competency to understand his *Miranda* rights. Baranoski explained that her evaluation involved several methods: A clinical interview, [intelligence quotient (IQ)] testing, personality testing, testing for reading and spelling proficiency, testing for arithmetic ability and general achievement testing. In addition to testing the defendant to determine his ‘overall competency,’ Baranoski also tested the defendant with a ‘set of questions that had to do with the specific tasks in understanding the *Miranda* warning[s] and making a choice to waive [his] rights.’

“Baranoski explained that those questions were part of a protocol developed by . . . Grisso, a forensic psychologist who has devoted his professional efforts to issues regarding ‘juvenile competency’ and who works with a research group that researches issues of competency. She also testified that the Grisso testing ‘instrument,’ which is part of the study protocol, consists of four parts that are scored by the test administrator.” Id., 429–30. “The first part tests a person’s ability to explain accurately, in his or her own words, what aspects of the *Miranda* warnings mean. The second part tests ‘recognition’ of *Miranda* rights, and the third part tests comprehension of the vocabulary [used in] the warnings. Finally, the fourth part, which involves pictures and stories about fictional persons being interrogated, tests a person’s ability to recognize, during an interrogation, the function of the *Miranda* warnings.” Id., 430 n.4.

“Baranoski explained the defendant’s results as to each [part] of the Grisso test; she reported that he scored in the bottom 20 percent of juvenile test takers. She opined, on the basis of the defendant’s results on the Grisso test, as well as on the basis of the defendant’s results on the other evaluative measures she [had] employed during her evaluation, that the defendant ‘did not understand the right to remain silent as it applied to incriminating information . . . and [that] he also did not understand the role of an attorney during the interrogation process.’

“The state argued in its . . . motion in limine that expert testimony based on the Grisso protocol was inadmissible under the standard for admissibility of expert testimony set out in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 589–92, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), and adopted by [this court] in *State v. Porter*, 241 Conn. 57, 68, 698 A.2d 739 (1997) (en banc), cert. denied, 523 U.S. 1058, 118 S. Ct. 1384, 140 L. Ed. 2d 645 (1998), because it lacked grounding in scientific fact and was based on conjecture and speculation. [At the conclusion of the hearing on the defendant’s motion to suppress], the state argued further that the testimony concerning the Grisso protocol fell ‘far short of what is required by *Daubert*’ because

of the test's rate of error and because the test lacked general acceptance in the appropriate expert community.

“In his opposition to the state's motion in limine, [defense counsel] argued that it was ‘unclear’ whether the court should apply a *Daubert* type of analysis to testimony related to or based on the Grisso test. [Defense counsel] then addressed the Grisso test's admissibility in terms of the criteria for admissibility set forth in *Daubert*. [Defense] counsel argued that the Grisso test was admissible under what he [deemed to be] *Porter's* ‘liberal standard of admissibility.’” *State v. Griffin*, supra, 77 Conn. App. 430–31.

The trial court granted in part and denied in part the defendant's motion to suppress. “The court suppressed any statements that the defendant had made to the police after such time when the police attempted to tape-record their interview, when, as the court found, the defendant had expressed his desire to terminate the [interview]. The court permitted testimony concerning the defendant's oral confession prior to that point.” *Id.*, 428.

The trial court thereafter issued a separate memorandum of decision in which it explained that it had granted the state's motion in limine. “The court deemed inadmissible Baranoski's testimony insofar as it concerned the Grisso test and her expert opinion insofar as it was based, in whole or in part, on the results of the defendant's performance on such test. The court based its ruling on its conclusion that the evidence relat[ing] to the Grisso [protocol] was inadmissible under [*Porter*]. The court concluded that the defendant had failed to prove that ‘the methodology underlying the technique is scientifically valid.’”⁶ *Id.*, 431.

At trial, the state adduced testimony in its case-in-chief regarding that portion of the defendant's oral confession that the trial court had determined was admissible. At the conclusion of the trial, the jury found the defendant guilty of manslaughter in the first degree with a firearm and carrying a pistol without a permit. On appeal, the Appellate Court rejected the defendant's claim that the trial court had abused its discretion in excluding Baranoski's testimony regarding the Grisso test. *Id.*, 442. In particular, the Appellate Court concluded that the trial court reasonably had determined, first, that that testimony was subject to the test adopted by this court in *Porter*; *id.*, 439; and second, that the testimony did not satisfy *Porter's* standard for the admissibility of scientific evidence. See *id.*, 440–42. We thereafter granted the defendant's petition for certification to appeal, limited to the following issue: “Whether the Appellate Court properly determined: (a) that a . . . *Porter* . . . hearing was required; and (b) that its application properly resulted in the exclusion of . . . Baranoski's testimony” (Citation omitted.) *State v.*

Griffin, supra, 265 Conn. 910. We agree with the Appellate Court that the trial court did not abuse its discretion either in subjecting the Grisso protocol to review under the *Porter* standard or in concluding that the defendant had failed to satisfy his burden of establishing that the Grisso protocol met the threshold requirements of *Porter*.

Before addressing the merits of the defendant's claims, we set forth the principles that govern our review of the trial court's ruling. "It is axiomatic that [t]he trial court's ruling on the admissibility of evidence is entitled to great deference. In this regard, the trial court is vested with wide discretion in determining the admissibility of evidence. . . . Accordingly, [t]he trial court's ruling on evidentiary matters will be overturned only upon a showing of a clear abuse of the court's discretion." (Citations omitted; internal quotation marks omitted.) *State v. Perkins*, 271 Conn. 218, 252, 856 A.2d 917 (2004). Furthermore, "[i]n determining whether there has been an abuse of discretion, every reasonable presumption should be made in favor of the correctness of the trial court's ruling" *Id.* Because a trial court's ruling under *Porter* involves the admissibility of evidence, we review that ruling on appeal for an abuse of discretion. E.g., *State v. Kirsch*, 263 Conn. 390, 399, 820 A.2d 236 (2003). Accordingly, the scope of our review is limited to a determination of whether the trial court abused its discretion in concluding, first, that Baranoski's testimony regarding the Grisso protocol was subject to review under *Porter*; and, second, that the Grisso protocol failed to satisfy the *Porter* standard.

I

We first consider whether the trial court abused its discretion in subjecting Baranoski's testimony regarding the Grisso test to review under *Porter*. The defendant contends that *Porter* is inapplicable because the Grisso test does not constitute "scientific evidence" within the contemplation of *Porter*. We disagree with the defendant's contention.

"In [*Porter*], we adopted the test for determining the admissibility of scientific evidence set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, [supra, 509 U.S. 579]. We noted therein two requirements established under *Daubert*. First, [we noted] that the subject of the testimony must be scientifically valid, meaning that it is scientific knowledge rooted in the methods and procedures of science . . . and is more than subjective belief or unsupported speculation. . . . This requirement establishes a standard of evidentiary reliability . . . as, [i]n a case involving scientific evidence, evidentiary reliability will be based upon scientific validity. . . . Second, [we noted that] the scientific evidence must fit the case in which it is presented. . . . In other words, proposed scientific testimony must be demon-

strably relevant to the facts of the particular case in which it is offered, and not simply be valid in the abstract.” (Citation omitted; internal quotation marks omitted.) *State v. Kirsch*, supra, 263 Conn. 398.

In adopting the *Daubert* approach in *Porter*, we “held that scientific evidence should be subjected to a flexible test, with differing factors that are applied on a case-by-case basis, to determine the reliability of the scientific evidence. . . . *Porter* explicitly stated that the flexible *Daubert* approach was a better approach than the test of general acceptance in the scientific community, which was established in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).” (Citation omitted.) *State v. Reid*, 254 Conn. 540, 545, 757 A.2d 482 (2000).

“Although this court in *Porter* explicitly adopted the *Daubert* test to determine the admissibility of scientific evidence; see *State v. Porter*, supra, 241 Conn. 68; we did not explicitly overrule Connecticut precedent regarding the evidence to which such a test should apply. Prior to *Porter*, this court had recognized that the *Frye* test for admissibility should not apply to all expert testimony, but only to that which involves ‘innovative scientific techniques’ *State v. [Borrelli]*, 227 Conn. 153, 163, 629 A.2d 1105 (1993); *State v. Hasan*, 205 Conn. 485, 489, 534 A.2d 877 (1987). In *Porter* we recognized that *Daubert’s* vagueness as to how and when to apply the factors of the test was necessary. *State v. Porter*, supra, 78. In order to maintain flexibility in applying the test, we did not define what constitutes ‘scientific evidence.’ *Id.*, 78–79.” *State v. Reid*, supra, 254 Conn. 546. “Consequently, our initial inquiry is whether the [evidence] at issue . . . is the type of evidence contemplated by *Porter*.” (Internal quotation marks omitted.) *Maher v. Quest Diagnostics, Inc.*, 269 Conn. 154, 169, 847 A.2d 978 (2004).

State v. Reid, supra, 254 Conn. 549, and *State v. Hasan*, supra, 205 Conn. 490, are useful starting points in our analysis. In *Reid*, we concluded that microscopic hair analysis is not the type of evidence that is subject to a threshold determination of reliability under *Porter*. *State v. Reid*, supra, 549. We explained that, “[a]lthough [the expert witness’] training [was] based in science, he testified about a subject that simply required the jurors to use their own powers of observation and comparison.” *Id.*, 547. The challenged evidence in *Reid* included an enlarged photograph displaying a microscopic image of the defendant’s hair strand, side-by-side with a hair strand recovered from the victim’s clothing, and expert testimony explaining the similarities and particular features of the hair strands. *Id.* Because “[t]he jurors were free to make their own determinations as to the weight they would accord the expert’s testimony in the light of the photograph and their own powers of observation and comparison”; *id.*, 547–48; we concluded that the admissibility of the chal-

lenged evidence was not contingent upon satisfying the *Porter* test. *Id.*, 549.

Similarly, in *State v. Hasan*, *supra*, 205 Conn. 490, “[w]e concluded that [a] podiatrist’s testimony [concerning the probability that a pair of sneakers would fit the defendant’s feet] was not scientific evidence subject to the *Frye* test because the podiatrist merely compared the footwear to the defendant’s feet. . . . Accordingly, [we determined that] the jury [was] in a position to weigh the probative value of the testimony without abandoning common sense and sacrificing independent judgment to the expert’s assertions based on his special skill or knowledge. . . . [T]he podiatrist’s testimony concerned a method, the understanding of which [was] accessible to the jury . . . and the value of the expertise lay in its assistance to the jury in viewing and evaluating the evidence.”⁸ (Citations omitted; internal quotation marks omitted.) *State v. Reid*, *supra*, 254 Conn. 546–47; see *State v. Hasan*, *supra*, 492–94. As we recently noted, “*Hasan* and *Reid* stand for the proposition that evidence, even evidence with its roots in scientific principles, which is within the comprehension of the average juror and which allows the jury to make its own conclusions based on its independent powers of observation and physical comparison, and without heavy reliance upon the testimony of an expert witness, need not be considered ‘scientific’ in nature for the purposes of evidentiary admissibility.” *Maher v. Quest Diagnostics, Inc.*, *supra*, 269 Conn. 170–71 n.22.

In contrast to the expert testimony in the aforementioned cases, Baranoski’s testimony concerning the Grisso protocol was not the kind of evidence that readily may be understood and evaluated by a fact finder on the basis of common sense or independent powers of observation or comparison. As the Appellate Court aptly explained: “Baranoski testified that the Grisso test is an evaluative tool: It consists of a series of four subtests that are meant to measure juvenile competency relative to *Miranda* warnings. She testified that psychologists have tested the Grisso test and concluded that there is ‘a consistency in the way it measures what it measures.’ She testified that the questions in the Grisso test are standardized. Portions of the test include pictures and hypothetical stories, both of which involve situations in which *Miranda* rights are implicated and about which test questions are asked.

“Baranoski also testified that a test taker’s responses to each inquiry are scored. She testified that ‘the scores give you an idea of how other people have rated answers consistent with what Grisso had found in his initial development of this tool. So, you look at how those responses compare with other responses that reflected a strong understanding or a not so good understanding of that particular question. There is an overall score

for the test, and the scores are just a way to think about the extent to which a part of this test was understood or not. So, if somebody gets them all right, looking at that, I say, well, compared to other people understanding the section, the person I am evaluating understood it [as] well as anybody else understood that section.’

“Baranoski further testified that she scored the defendant’s responses to each section of the test and that she compared the scores to a summary of scores compiled by Grisso for his ‘target group’ of test takers. Baranoski testified that this scoring information is set forth in tables provided with the testing materials. Although Baranoski testified that the defendant scored in the bottom 20 percent of juvenile test takers, she testified that the test [cannot] answer the question of whether he understood his *Miranda* rights. Baranoski testified in that regard that she considered the defendant’s results on many different tests and that she applied her expertise in evaluating the defendant in reaching her expert opinion that he ‘did not understand his right to remain silent as it applied to incriminating information, and [that] he also did not understand the role of an attorney during the interrogation process.’” *State v. Griffin*, supra, 77 Conn. App. 437–38.

The Appellate Court explained further: “The testing materials [utilized by Baranoski], including questions about words and phrases and questions based on hypothetical stories and pictures, constitute a scientific tool designed to assess comprehension of *Miranda* rights. It is difficult to label those instruments as constituting something otherwise. The scoring materials provided with the testing instruments contain[ed] detailed instructions as to how each response should be graded. The object of the Grisso test is to assign point values to a test taker’s responses and to compare that test taker’s scores to the scores of test takers in Grisso’s original study group. The test is based on the premise that the questions, hypothetical stories and pictures effectively will measure comprehension and that the scoring reflects accurately such comprehension.” *Id.*, 438–39.

Thus, Baranoski’s testimony concerning the Grisso protocol was predicated on the results of a scientific instrument or tool and not solely on her observations, educational background or experience. “[T]he . . . testimony [at issue] was based on a method employed by the expert witness to assess comprehension. Neither powers of observation, comparison nor common sense, however, could be used [by the trier of fact] to assess the validity of the method underlying the Grisso test and in determining whether it accurately measures what it purports to measure. Instead, the methodology underlying the test rested on . . . scientific principles, theory or experiment in the field of psychology.” *Id.*, 439. We agree with the Appellate Court that, in such circum-

stances, a *Porter* inquiry was a necessary predicate to admissibility.

The defendant contends that we should apply a more lenient standard in determining whether a *Porter* analysis is necessary when, as in the present case, scientific evidence is proffered to a court rather than a jury. We reject this argument. It is true that one reason for requiring a threshold determination of reliability in regard to such evidence is to preclude the use of testimony based on “obscure scientific theories . . . that [have] the potential to mislead lay jurors awed by an aura of mystic infallibility surrounding scientific techniques, experts and the fancy devices employed.” (Citation omitted; internal quotation marks omitted.) *State v. Reid*, supra, 254 Conn. 540. We also acknowledge that most judges, by virtue of their gatekeeper function, “will probably develop at least some facility for understanding science beyond the typical juror’s level of understanding.” (Internal quotation marks omitted.) *State v. Porter*, supra, 241 Conn. 73. Nevertheless, the fundamental purpose of a *Porter* hearing is the same irrespective of whether the trier of fact is a court or a jury, namely, to ensure, first, that the proffered scientific evidence is predicated on reliable scientific methods and procedures, and, second, that the evidence is relevant to the facts of the case. See, e.g., *State v. Kirsch*, supra, 263 Conn. 398. Consequently, the standard for determining the admissibility of scientific evidence is not dependent upon the identity of the trier of fact.

In further support of his claim that he should have been permitted to adduce Baranoski’s testimony regarding the Grisso test without a *Porter* hearing, the defendant relies on two cases from other jurisdictions in which testimony relating to that test was admitted into evidence, apparently without being subject to scrutiny under *Daubert*, *Frye* or similar standards for the admissibility of scientific evidence. See *State v. Caldwell*, 611 So. 2d 1149, 1150, 1152 (Ala. App. 1992), cert. denied, 510 U.S. 904, 114 S. Ct. 284, 126 L. Ed. 2d 234 (1993); *People v. Phillips*, 226 Ill. App. 3d 878, 882–83, 888, 589 N.E.2d 1107, appeal denied, 146 Ill. 2d 645, 602 N.E.2d 469 (1992). Those cases do not support the defendant’s contention, however, because they contain no indication that a challenge had been raised to the admissibility of the testimony relating to the Grisso test. Indeed, we know of no case in which testimony concerning the Grisso test has been admitted into evidence over objection. By contrast, in at least two cases, testimony regarding the Grisso test or similar protocol was excluded following a preliminary hearing on admissibility. See *Carter v. State*, 697 So. 2d 529, 533 (Fla. App. 1997) (testimony concerning Grisso test rejected under *Frye*’s general acceptance standard); *People v. Rogers*, 247 App. Div. 2d 765, 766, 669 N.Y.S.2d 678 (testimony concerning similar protocol rejected under *Frye*), appeal denied, 91 N.Y.2d 976, 695 N.E.2d 725, 672 N.Y.S.2d 856

(1998). We note, finally, that several other cases relied on by the defendant also are inapposite because, although they involved expert testimony regarding the ability of an accused to understand *Miranda* warnings, the relevant testimony in those cases did not concern the Grisso test. See *United States v. Aikens*, 13 F. Sup. 2d 28, 32 (D.D.C. 1998); *People v. Bernasco*, 138 Ill. 2d 349, 362–63, 562 N.E.2d 958 (1990), cert. denied, 500 U.S. 932, 111 S. Ct. 2052, 114 L. Ed. 2d 458 (1991); *People v. Daoud*, 462 Mich. 621, 628–29, 614 N.W.2d 152 (2000).⁹

We therefore conclude that the trial court properly determined that Baranoski's testimony based in whole or in part on the Grisso protocol was subject to a *Porter* inquiry. We turn next to the issue of whether the trial court reasonably concluded that Baranoski's testimony failed to meet the *Porter* standard.

II

Generally, “[a] witness qualified as an expert by knowledge, skill, experience, training, education or otherwise may testify in the form of an opinion or otherwise concerning scientific . . . knowledge, if the testimony will assist the trier of fact in understanding the evidence or in determining a fact in issue.” Conn. Code Evid. § 7-2. In order to determine whether an expert witness' testimony concerning scientific evidence will assist the trier of fact, the trial judge must undertake “a two part inquiry [in accordance with *Porter*]: [1] whether the reasoning or methodology underlying the [scientific theory or technique in question] is scientifically valid and . . . [2] whether that reasoning or methodology properly can be applied to the facts in issue. . . . In other words, before it may be admitted, the trial judge must find that the proffered scientific evidence is both reliable and relevant.” (Internal quotation marks omitted.) *State v. Kelly*, 256 Conn. 23, 73, 770 A.2d 908 (2001); see also Conn. Code Evid. § 7-2, commentary.

With regard to the reliability prong of the inquiry, the court in *Porter* identified four nonexclusive factors for “judges to consider in determining whether a particular theory or technique is based on scientific knowledge: (1) whether it can be, and has been, tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the known or potential rate of error, including the existence and maintenance of standards controlling the technique's operation; and (4) whether the technique is, in fact, generally accepted in the relevant scientific community.” *State v. Porter*, supra, 241 Conn. 64. We further noted that “[s]everal other factors may properly play a role in a court's assessment of the validity of a scientific methodology. . . . [Those factors include] the prestige and background of the expert witness supporting the evidence . . . [t]he extent to which the scientific technique in question relies on subjective interpretations and judgments by the testifying expert, rather than on objec-

tively verifiable criteria . . . whether a testifying expert can present and explain the data and methodology underlying his or her scientific testimony in such a manner that the fact finder can reasonably and realistically draw its own conclusions therefrom . . . [and] whether the scientific technique underlying the proffered expert testimony was developed and implemented solely to develop evidence for in-court use, or whether the technique has been developed or used for extrajudicial purposes.” (Citations omitted.) *Id.*, 85–86. Recognizing the indefiniteness inherent in applying this multifactor approach, we observed that “[t]he actual operation of each factor, as is the determination of which factors should be considered at all, depends greatly on the specific context of each case” *Id.*, 86–87.

In its memorandum of decision concerning the state’s motion in limine, the trial court concluded that the defendant had failed to establish “that the Grisso test has sufficient scientific validity . . . for the court to accept it as reliable evidence.” The trial court further found that the methodology underlying the Grisso test had not been subject either to sufficient testing since its development in 1981 or to adequate peer review and publication. In addition, the trial court concluded that the defendant had failed to demonstrate that the Grisso test is generally accepted in the relevant scientific community.

In support of his claim that the trial court abused its discretion in excluding Baranoski’s testimony concerning the Grisso test, the defendant contends that the court engaged in an unduly mechanistic, and therefore improper, review of the factors that we identified in *Porter* as among those that are relevant to a determination of the admissibility of scientific evidence. In particular, the defendant contends that the trial court failed to give proper weight to certain factors that tend to support the admissibility of Baranoski’s testimony regarding the Grisso test, including Baranoski’s experience and qualifications and the scientific and legal literature.

We are unpersuaded by the defendant’s claim. Although Baranoski testified that the Grisso protocol has been discussed in various professional journals and at a number of seminars, the trial court reasonably found, upon due consideration of Baranoski’s testimony, that the Grisso protocol had not been critically evaluated by Grisso’s peers and that it had not been generally accepted as scientifically valid. Similarly, Baranoski’s testimony did not establish that the Grisso test is widely used; in fact, Baranoski acknowledged that she had administered the Grisso test to a juvenile on but one prior occasion. Moreover, contrary to the defendant’s assertion, there is nothing in the record to suggest that the court, in evaluating the validity of the Grisso

test, failed to give appropriate weight to Baranoski's professional standing and credentials. On the contrary, the record reflects that the trial court properly considered the relevant *Porter* factors and reasonably found them to be lacking. Thus, there is no indication that the court's balancing of the pertinent *Porter* factors was unreasonable or otherwise flawed.

In challenging the trial court's conclusion, the defendant emphasizes Baranoski's testimony regarding the purported validity of the Grisso test based on "inter-rater reliability" and "test, retest reliability." According to Baranoski, interrater reliability is a measure of the reliability of a test based on the extent to which the results of the test are the same when the test is administered to the same subject by different testers. Test, retest reliability is a measure of the reliability of a test based on the extent to which the results of the test are the same when it is given to the same subject on two different occasions by the same tester. These measures of reliability, however, focus upon the relative consistency of the results of the test rather than upon the validity of the methodology upon which the test is founded. Consequently, to the extent that the defendant maintains that Baranoski's testimony regarding the purported reliability of the Grisso test necessarily was entitled to significant weight, that assertion is not persuasive.

The defendant also underscores the fact that the empirical studies from which the Grisso protocol was developed have been cited in a number of judicial opinions and professional journal articles. The great majority of those references, however, do not concern the methodology underlying the Grisso protocol but, rather, stand for the general proposition, gleaned from those studies, that juvenile arrestees often have particular difficulty understanding *Miranda* warnings. Thus, the references to the Grisso test identified by the defendant provide little, if any, support for his contention that the trial court had abused its discretion in excluding Baranoski's testimony.

We note, finally, that, in agreeing with the Appellate Court that the trial court did not abuse its discretion in excluding Baranoski's testimony concerning the Grisso test, we do not denigrate the credentials or expertise of either Baranoski or Grisso. On the contrary, we have no reason to doubt that both are well respected in their fields. Although that fact was one of several factors relevant to the determination of whether Baranoski's testimony was sufficiently reliable to warrant its consideration by the trial court; see *State v. Porter*, supra, 241 Conn. 86; the ultimate question for the court was whether the Grisso protocol itself bore adequate indicia of reliability to merit the admission of Baranoski's testimony based in whole or in part on that protocol. On the basis of the evidence presented at the suppression

hearing, we simply cannot say that the trial court abused its discretion in ruling that the Grisso test did not satisfy the *Porter* standard. Of course, we do not foreclose the possibility that, in a future case, sufficient evidence regarding the reliability of the Grisso test will be presented such that it may be found to pass muster under *Porter*. We conclude today only that the trial court in the present case reasonably determined, in light of the particular evidence adduced, that the defendant had failed to meet his burden, under *Porter*, of demonstrating the threshold reliability of the Grisso test.

The judgment of the Appellate Court is affirmed.

In this opinion the other justices concurred.

¹ The state charged the defendant with murder in violation of General Statutes § 53a-54a (a). The jury, however, found the defendant guilty of the lesser included offense of manslaughter in the first degree with a firearm.

² The state also charged the defendant with one count of robbery in the second degree in violation of General Statutes § 53a-135 (a) (1) and one count of larceny in the second degree in violation of General Statutes § 53a-123 (a) (3). The jury found the defendant not guilty on those counts.

³ The trial court sentenced the defendant to a total effective term of forty years imprisonment, execution suspended after thirty years, and five years probation.

⁴ On appeal to the Appellate Court, the defendant also challenged the admissibility of certain testimony adduced by the state regarding the circumstances surrounding his oral confession, and the oral confession itself, on the ground that the trial court improperly concluded that the defendant knowingly, intelligently and voluntarily had waived his rights under *Miranda v. Arizona*, 384 U.S. 436, 86 S. Ct. 1602, 16 L. Ed. 2d 694 (1966). See *State v. Griffin*, supra, 77 Conn. App. 426, 442-43, 450. The Appellate Court rejected these claims; id., 443, 450; which are not the subject of this appeal.

⁵ *Miranda v. Arizona*, 384 U.S. 436, 86 S. Ct. 1602, 16 L. Ed. 2d 694 (1966).

⁶ In its memorandum of decision on the state's motion in limine, the trial court also explained, however, that, in rendering its decision on the defendant's motion to suppress, the court *had* considered other testimony by Baranoski regarding the defendant's ability to understand his *Miranda* rights. That testimony included the defendant's lower than average intelligence quotient, his sixth grade reading level, his repeated absence from school, his difficulty in forming concepts, his attention and concentration deficits and his long-standing use of drugs and alcohol.

⁷ As we previously have noted, this court had applied the *Frye* test of general acceptance in cases decided before *Porter*. See *State v. Porter*, supra, 241 Conn. 66-67.

⁸ Likewise, in *State v. Borrelli*, supra, 227 Conn. 153, this court, relying on our analysis in *Hasan*, held that "satisfaction of the *Frye* test [was] not a necessary precondition for the admission of expert testimony on battered woman's syndrome." Id., 165. In *Borrelli*, we observed that the witness "did not offer any opinion as to whether [the victim] was a battered woman . . . did not apply any scientific instrument or test to specific evidence in the case, [and] did [not] use battered woman's syndrome as a diagnostic tool. . . . Instead, [the witness'] testimony was based on his observations of a large group of battered women through the lens of his educational background and experience." Id., 164-65.

⁹ Although Grisso himself testified as an expert witness at trial in *Daoud*, it was unclear from the opinion of the Michigan Supreme Court whether his testimony was based in whole or in part on his protocol. Even if we assume that it was, no objection apparently was raised to such testimony.