

18-1906 (L)
United States v. Requena

**UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT**

August Term 2019

(Argued: October 22, 2019 Decided: November 4, 2020)

Nos. 18-1906-cr, 18-1923-cr

UNITED STATES OF AMERICA

Appellee

-v.-

BRIAN REQUENA, ANDREW RAYMOND,¹

Defendants-Appellants

Before: LIVINGSTON, *Chief Judge*, KEARSE and WALKER, *Circuit Judges*.

A jury in the Northern District of New York convicted Brian Requena and Andrew Raymond, who together ran a synthetic marijuana production and distribution operation, on one count of conspiracy to possess with intent to distribute and to distribute a controlled substance analogue. Because the synthetic marijuana they sold did not contain any chemicals listed on the federal controlled substance schedules, the jury convicted Requena and Raymond pursuant to the

¹ The Clerk of Court is respectfully instructed to amend the caption as set forth above.

Controlled Substance Analogue Enforcement Act, which provides that substances with chemical and pharmacological properties “substantially similar” to those of substances listed on schedule I or II are treated for the purposes of federal law as controlled substances. Requena and Raymond challenge their convictions and the sentences imposed by the district court (Mordue, J.), arguing that (1) the Analogue Act’s “substantial similarity” requirement is unconstitutionally vague on its face; (2) the trial evidence was insufficient to prove their knowledge that they were dealing in a “controlled substance”; (3) the district court erroneously permitted the government’s experts to opine that the six synthetic cannabinoids at issue had features “substantially similar” to those of a scheduled substance; (4) the district court erroneously permitted the jury to convict Defendants without unanimous agreement on which of the six synthetic cannabinoids at issue qualified as a controlled substance analogue; and (5) the district court erroneously sentenced them based on the total quantity of controlled substance analogues involved in the conspiracy without determining which of the substances involved actually qualified as a controlled substance analogue. We conclude that each of their claims is meritless. Accordingly, the judgment of the district court is AFFIRMED.

FOR APPELLEE:

STEVEN D. CLYMER, Assistant United States Attorney (Carla B. Freedman, Michael F. Perry, Assistant United States Attorneys, on the brief), *for* Grant C. Jaquith, United States Attorney for the Northern District of New York, Syracuse, NY, *for the United States of America*.

FOR DEFENDANTS-APPELLANTS:

JAMES E. FELMAN (Brandon K. Breslow, *on the brief*), Kynes Markman & Felman, PA, Tampa, FL, *for Brian Requena and Andrew Raymond*.

DEBRA ANN LIVINGSTON, *Chief Judge*:

Defendants-Appellants Brian Requena and Andrew Raymond (together, “Defendants”) appeal from June 22, 2018 judgments of conviction and sentence in

the United States District Court for the Northern District of New York (Mordue, J.), entered after a jury convicted Defendants of conspiracy to possess with intent to distribute and to distribute a controlled substance analogue in violation of 21 U.S.C. §§ 846, 841(a)(1), and 841(b)(1)(C); and of conspiracy to commit money laundering pursuant to 18 U.S.C. § 1956(a)(1)(A)(i), (a)(2)(A), and (h). Defendants' convictions arose from their management of a business directed at the production and sale of synthetic marijuana, which Defendants and their employees manufactured using at least six distinct synthetic cannabinoids.

At the time Defendants conspired to distribute them, these synthetic cannabinoids were not listed on the federal controlled substance schedules. Instead, the government charged that these substances were "controlled substance analogues" under the Controlled Substance Analogue Enforcement Act of 1986 ("Analogue Act"). The Analogue Act identifies a controlled substance analogue as a substance with chemical and pharmacological properties "substantially similar" to those of a substance listed on schedule I or II, 21 U.S.C. § 802(32), and directs, in part, that these substances—if "intended for human consumption"—"be treated[] for the purposes of any Federal law as a controlled substance in schedule I," *id.* §

813(a).² In turn, 21 U.S.C. § 841(a)(1) and (b)(1)(C) prohibit the distribution of schedule I controlled substances and subject violators to up to twenty years imprisonment.

Defendants' appeal challenges, in several respects, the determination that the Analogue Act subjects them to conviction and sentence for a violation of the federal drug laws. Principally, they argue (1) that the Analogue Act's "substantial similarity" requirement is unconstitutionally vague on its face; (2) that the trial evidence was insufficient to prove Defendants' knowledge that they were dealing in a "controlled substance"; (3) that the district court erroneously permitted the government's experts to opine that the six synthetic cannabinoids at issue had features "substantially similar" to those of a scheduled substance; and (4) that the district court erroneously permitted the jury to convict Defendants without unanimous agreement on which of the six synthetic cannabinoids at issue

² Specifically, 21 U.S.C. § 802(32) provides that, in relevant part, a "controlled substance analogue" is a substance "(i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II; [and] (ii) which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than [that] of a controlled substance in schedule I or II" See, e.g., *United States v. Demott*, 906 F.3d 231, 236 n.2 (2d Cir. 2018) (assuming without deciding that these requirements are conjunctive). Section 813(a), in turn, provides that "[a] controlled substance analogue shall, to the extent intended for human consumption, be treated, for the purposes of any federal law as a controlled substance." 21 U.S.C. § 813(a).

qualified as a controlled substance analogue. Alternatively, they urge us to remand for resentencing because the district court calculated their base offense levels—based in part on the total quantity of controlled substances involved in the conspiracy—without expressly determining which of the six synthetic cannabinoids qualified as controlled substance analogues.

We reject each of Defendants’ arguments and AFFIRM the judgment of the district court.

BACKGROUND

I. Factual Background³

A.

Sometime in early 2013, Defendant-Appellant Andrew Raymond called Roger Upchurch with a business proposition. In 2011 and 2012, Raymond had worked for a company called Airtime Distribution selling, among other things, a selection of synthetic marijuana that he marketed as “herbal incense.” He reached out to Upchurch—who owned an Arizona-based synthetic marijuana manufacturing and distribution company called Driftwood Enterprises—in an

³ The factual background presented here is derived primarily from testimony and exhibits presented by the government at trial.

effort to “get back into the business.” Trial Tr. 348. As it turned out, Upchurch was nearing retirement and very receptive to Raymond’s offer to join forces.

After a few weeks of discussions, Raymond and Upchurch formed a company called Real Feel Products and moved all of Upchurch’s synthetic marijuana production operations from Phoenix to a warehouse in Los Angeles, where Raymond lived. Upchurch, who lived in Indianapolis and visited Real Feel’s California warehouse only infrequently, soon ceded nearly all operational control of the new venture to Raymond, along with an equal 50% stake in the company. Real Feel proved quite lucrative for both Raymond and Upchurch, netting each partner profits of up to \$20,000 a week in 2013 and early 2014. Between 90 and 95% of these profits came from the sale of synthetic marijuana.

As Upchurch’s involvement in Real Feel waned during the late summer and early fall of 2013, Raymond hired Defendant-Appellant Brian Requena to be the company’s general manager. In that role, Requena served as Raymond’s “right-hand man,” Trial Tr. 967, supervising Real Feel’s sales team and aiding in the company’s overall administration. Shortly after Upchurch left Real Feel entirely in February 2014, Raymond made Requena an equal partner. From that point until at least December of 2014, each man drew weekly profits of between \$50,000 and

\$100,000. As before, around 90% of these profits came from the sale of synthetic marijuana.

B.

From its establishment in 2013 to the time of Defendants' arrests in 2015, Real Feel's core operations remained relatively consistent. The company obtained—first through Upchurch and then through Raymond—multi-kilogram quantities of raw synthetic cannabinoids in powder form from chemical suppliers based in China. A division of Real Feel's approximately 25 employees dissolved the raw chemicals in acetone and treated leafy plant matter with the resulting solution. Once the leaves were dry, employees added flavoring and placed the finished product—which they called “herbal incense” or “potpourri”—into small bags for sale. Despite this nomenclature, and the fact that each bag bore the label “not for human consumption,” Trial Tr. 765, Defendants admit that everyone involved “knew the product was sold with the intention that the consumer would ingest it for the purpose of getting high,” Appellants' Br. 4.

Employees shipped the finished and bagged product to customers from various UPS shipping locations surrounding Real Feel's warehouse. Defendants sold the bulk of Real Feel's synthetic marijuana to wholesalers, including

Raymond's former employer Airtime Distribution and another distribution company called Eagle Eye Products. Sales to these wholesalers were significant: Between April 2013 and February 2014, revenues just from Eagle Eye and another distributor with overlapping ownership ran to nearly \$2 million. Real Feel's sales team also sold synthetic marijuana directly to smoke shops throughout the United States.

It was not always easy for Real Feel to obtain the raw synthetic cannabinoids that formed the heart of its manufacturing enterprise. From time to time, a shipment of raw chemical would be seized at customs. And periodically, Defendants learned that the United States Drug Enforcement Administration ("DEA") had decided to list the active chemical in their synthetic marijuana on the federal controlled substance schedules. When this happened, Defendants sold all remaining product incorporating that chemical at a discount and arranged for Real Feel's suppliers to ship an alternative chemical intended to produce the same high. As a result, over the course of Real Feel's existence, Defendants' synthetic marijuana incorporated a number of different synthetic cannabinoids.

C.

Unbeknownst to Defendants, Real Feel was under investigation from nearly

the time of its establishment. In early 2013, the New York State Police discovered synthetic marijuana during a search of a smoke shop in DeWitt, New York. The DEA adopted the investigation and traced the contraband to Eagle Eye. Further inquiry revealed that Eagle Eye, in turn, bought its synthetic marijuana from Real Feel. A few months after the seizure in DeWitt, DEA agents linked both Eagle Eye and Real Feel to synthetic marijuana found in another smoke shop in Auburn, New York. Around the same time, DEA agents in Los Angeles recovered artificial cannabinoid residue from trash bags that Defendants' employees had discarded in a dumpster outside Real Feel's warehouse. The same agents also observed Raymond and other Real Feel personnel delivering boxes to Eagle Eye's offices in California.

On February 12, 2014, federal agents executed search warrants on multiple locations including Real Feel's warehouses in Los Angeles.⁴ Their searches recovered, *inter alia*, several varieties of raw synthetic cannabinoids, a substantial quantity of finished synthetic marijuana, and sales records. The records connected Real Feel to numerous sales of synthetic marijuana to various smoke shops in the

⁴ By this point, Real Feel had expanded its operations to two warehouses with a common parking lot.

Northern District of New York, where Defendants were ultimately tried. Following the searches on February 12, 2014, Upchurch terminated his involvement with Real Feel, began cooperating with the DEA's investigation, and ultimately pleaded guilty in the Southern District of Indiana to charges mirroring those brought against Defendants in the Northern District of New York.

After the February seizures, Raymond suspended Real Feel's operations, but did not dissolve the company. Instead, about two months later, Defendants revived Real Feel and resumed production of synthetic marijuana in a larger warehouse in a different part of Los Angeles. Requena, who became Raymond's partner shortly after reopening, opened several new bank accounts and postal boxes on Real Feel's behalf, often identifying Real Feel as a clothing business. Real Feel's operations, however, remained sharply focused on synthetic marijuana and, as noted above, continued to net its owners substantial profits.

On April 14, 2015—after further investigation that included the seizure of more than 50 kilograms of synthetic cannabinoids shipped to Requena from Real Feel's suppliers in China—federal agents executed a warrant to search Real Feel's new warehouse. There, agents recovered dozens of bins of synthetic marijuana and multiple kilograms of raw synthetic cannabinoids. In all, seizures of Real

Feel's product from its warehouses and its customers' shops connected Defendants to at least six synthetic cannabinoid compounds. On the same day, both Defendants were arrested and taken into federal custody.

II. Procedural History

On March 24, 2016, a federal grand jury in the Northern District of New York returned the operative indictment, which charged both Raymond and Requena with one count of conspiring to distribute and possess with intent to distribute one or more controlled substance analogues in violation of 21 U.S.C. § 841(a)(1)—rendering them subject to sentencing under § 841(b)(1)(C)—and one count of conspiracy to commit promotional and international money laundering in violation of 18 U.S.C. § 1956(a)(1)(A)(i), (a)(2)(A), and (h). The indictment specifically alleged that Defendants' offense involved the following six substances, each of which it alleged was a controlled substance analogue: XLR11, PB-22, 5F-PB-22, AB-PINACA, 5F-AB-PINACA, and APP-CHMINACA.

A jury trial commenced in the United States District Court for the Northern District of New York (Mordue, J.) on July 12, 2017 and concluded on July 26, 2017. Numerous witnesses—including Upchurch, former Real Feel employees, former Real Feel customers, and DEA agents involved in the investigation—testified

regarding Real Feel's operations and Defendants' roles in them. The government also offered the expert testimony of DEA chemist Michael Van Linn and DEA pharmacologist Jordan Trecki, who opined that the six chemicals alleged in the indictment were substantially similar in chemical structure and pharmacological effect to various substances listed on the federal controlled substance schedules.

The jury retired to deliberate on July 25, 2017. Prior to its deliberations, the district court instructed the jury, *inter alia*, that in order to convict Defendants of conspiracy to distribute or possess with intent to distribute a controlled substance, it must "unanimously agree that the government has proven that at least one of the substances identified in Count [One] of the indictment qualifies as a controlled substance analogue" but that it "need not . . . unanimously agree on which of the substance or substances qualify." A. 291–92. Neither party objected to this or any other part of the instructions.

On July 26, 2017, the jury returned guilty verdicts as to both defendants on both counts charged in the indictment. On June 20, 2018, the district court sentenced Raymond to consecutive terms of 180 months' imprisonment on Count One and 120 months' imprisonment on Count Two, followed by a three-year term of supervised release. On the same day, it sentenced Requena to consecutive terms

of 180 months' imprisonment on Count One and 60 months' imprisonment on Count Two, followed by a three-year term of supervised release. Both sentences were substantially below the range indicated by the United States Sentencing Guidelines, which the district court calculated based in part on the total weight of controlled substance analogues federal agents seized from Defendants' warehouses. Two days later, the district court entered its judgments of conviction and sentence as to both Raymond and Requena. Both Defendants timely appealed.

DISCUSSION

I. Defendants' Vagueness Challenge

Defendants first argue that we must vacate their convictions because the Analogue Act is unconstitutionally vague on its face. They claim that since no objective standard governs a juror's determination of whether a substance has a chemical structure and pharmacological effects that are "substantially similar" to those of a scheduled substance, the Act's definition of a "controlled substance analogue" invites impermissibly arbitrary enforcement and provides potential defendants with no warning about what conduct is prohibited. Defendants argue that the Analogue Act is inherently vague as applied against *any* potential defendant—necessarily including themselves—but make no separate, more

specific argument that the Act is unconstitutionally vague as applied to the facts of this case.

A “statute is unconstitutionally vague if it fails to define the unlawful conduct with ‘sufficient definiteness that ordinary people can understand what conduct is prohibited,’ or if its vagueness makes the law unacceptably vulnerable to ‘arbitrary enforcement.’” *United States v. Demott*, 906 F.3d 231, 237 (2d Cir. 2018) (quoting *Kolender v. Lawson*, 461 U.S. 352, 357–58 (1983)). Vagueness challenges typically concern a statute “as applied” to the challenger, who professes that the law in question “cannot constitutionally be applied to the challenger’s individual circumstances.” *Copeland v. Vance*, 893 F.3d 101, 110 (2d Cir. 2018). But a party may also challenge a statute as vague *on its face*, asserting that it is “so fatally indefinite that it cannot constitutionally be applied to anyone.” *Id.* In the ordinary case, a facial vagueness challenge carries a significant burden: “the challenger must establish that no set of circumstances exists under which the Act would be valid.” *Id.* (quoting *United States v. Salerno*, 481 U.S. 739, 745 (1987)).

The Supreme Court has recognized three circumstances in which a statute that is not necessarily vague in all applications may nonetheless be void for vagueness on its face. In the most established of these, a challenger may raise a

facial challenge if the statute implicates rights protected by the First Amendment, even if the statute is not vague as applied to that challenger's conduct. *See, e.g., Parker v. Levy*, 417 U.S. 733, 759 (1974) ("First Amendment . . . attacks have been permitted 'on overly broad statutes with no requirement that the person making the attack demonstrate that his own conduct could not be regulated by a statute drawn with the requisite narrow specificity.'" (quoting *Dombrowski v. Pfister*, 380 U.S. 479, 486 (1965))); *cf. Kolender*, 461 U.S. at 358–59 n.8 ("[W]e permit a facial challenge if a law reaches 'a substantial amount of constitutionally protected conduct.'" (quoting *Village of Hoffman Estates v. Flipside, Hoffman Estates, Inc.*, 455 U.S. 489, 494 (1982))). A plurality of the Supreme Court has also suggested that "a criminal law lacking a *mens rea* requirement and burdening a constitutional right 'is subject to facial attack' '[w]hen vagueness permeates the text of such a law,'" even if that law does not impinge on rights guaranteed by the First Amendment specifically. *N.Y. State Rifle & Pistol Ass'n v. Cuomo*, 804 F.3d 242, 265 (2d Cir. 2015) (alteration in original) (quoting *City of Chicago v. Morales*, 527 U.S. 41, 55 (1999) (plurality opinion)). Finally, in a recent trilogy of cases beginning with *Johnson v. United States*, 576 U.S. 591 (2015), the Supreme Court struck down three statutes that required courts to evaluate whether the "idealized ordinary case" of a

criminal offense constitutes a “violent felony,” 576 U.S. 602–04, or a “crime of violence,” *Sessions v. Dimaya*, 138 S. Ct. 1204 (2018); *United States v. Davis*, 139 S. Ct. 2319 (2019). *Johnson* held, and *Dimaya* reaffirmed, that such a statute may be void for vagueness even though “some conduct . . . clearly falls within the provision’s grasp.” *Johnson*, 576 U.S. at 602; *Dimaya*, 138 S. Ct. at 1214 n.3. Neither the Supreme Court nor our Court has definitively resolved whether facial vagueness challenges not based on the First Amendment may proceed against statutes that can constitutionally be applied to the challenger’s *own* conduct. *Copeland*, 893 F.3d at 111; *see also Farrell*, 449 F.3d at 495 n.12.

Instead, we typically evaluate “[v]agueness challenges to statutes not threatening First Amendment interests . . . in light of the facts of the case at hand,” *i.e.*, only “on an as-applied basis.” *Maynard v. Cartwright*, 486 U.S. 356, 361 (1988); *accord United States v. Holcombe*, 883 F.3d 12, 17 (2d Cir. 2018) (“Where . . . First Amendment rights are not implicated, we evaluate such a challenge . . . [without] regard to the *facial* validity of the criminal statute or regulation at issue.” (emphasis added)). And we have often declined to entertain facial challenges where the challenger asserts no infringement of First Amendment or other fundamental rights protected by the Constitution. *See Dickerson v. Napolitano*, 604 F.3d 732, 743–

45 (2d Cir. 2010). Despite this “baseline aversion to facial challenges,” we are permitted to consider them in appropriate cases,⁵ *id.* at 742, and we have done so in the past to facilitate a challenge’s definitive rejection, *see United States v. Rybicki*, 354 F.3d 124, 131–32 & n.3, 144 (2d Cir. 2003) (en banc) (“While it is unclear . . . whether it is appropriate to decide the question of the asserted facial invalidity . . . , we think that a conclusion of facial invalidity would be inconsistent with the foregoing analysis.”); *see also Farrell*, 449 F.3d at 495 n.11 (acknowledging the *Rybicki* court’s decision to “assess[] the facial validity of the statute even though no First Amendment rights were implicated.”). But even where we have addressed the merits of a facial challenge outside the First Amendment context, we have recognized the Supreme Court’s instruction to at least “examine the complainant’s conduct before analyzing other hypothetical applications of the law.” *Rybicki*, 354 F.3d at 130 (quoting *Village of Hoffman Estates v. Flipside, Hoffman Estates, Inc.*, 455 U.S. 489, 495 (1982)).

⁵ Certain of our decisions’ unequivocal language notwithstanding, *see Holcombe*, 883 F.3d at 17; *United States v. Nadi*, 996 F.2d 548, 550 (2d Cir. 1993), we have declined to endorse wholesale the proposition that facial challenges are entirely foreclosed outside the First Amendment context. *See N.Y. State Rifle & Pistol Ass’n*, 804 F.3d at 265; *Dickerson*, 604 F.3d at 733; *United States v. Rybicki*, 354 F.3d 124, 131–32 & n.3, 144 (2d Cir. 2003) (en banc).

In this case, however, we need not examine either Defendants’ conduct or “other hypothetical applications of the law,” *id.*, in order to reject their facial challenge—assuming *arguendo* that they are entitled to bring one at all. Despite Defendants’ contention that the Analogue Act is vague as applied to all possible prosecutions, precedent definitively establishes that they cannot “establish that no set of circumstances exists under which the Act would be valid.” *Salerno*, 481 U.S. at 745. We have on several occasions upheld the Analogue Act’s definition of a “controlled substance analogue” against as-applied vagueness challenges.⁶ *Demott*, 906 F.3d at 237–39; *United States v. Ansaldi*, 372 F.3d 118, 122–24 (2d Cir. 2004), *abrogated on other grounds by* *McFadden v. United States*, 576 U.S. 186 (2015); *United States v. Roberts*, 363 F.3d 118, 122–27 (2d Cir. 2004); *see also United States v. Lawton*, 759 F. App’x 66, 67 (2d Cir. 2019) (summary order). It is therefore impossible for Defendants to demonstrate the Analogue Act’s invalidity as applied to every conceivable defendant.

Defendants attempt to skirt these precedents by arguing that the Supreme

⁶ Other circuits to have considered this issue have likewise concluded that the “substantially similar” language in the Analogue Act is not unconstitutionally vague. *See, e.g., United States v. Turcotte*, 405 F.3d 515, 531–32 (7th Cir. 2005) (collecting cases), *abrogated on other grounds by United States v. Novak*, 841 F.3d 721, 729 (7th Cir. 2016).

Court’s recent decisions in *Johnson*, *Dimaya*, and *Davis*—each of which invalidated a criminal statute as facially vague notwithstanding the potential for conduct that “clearly falls within the provision’s grasp,” *Johnson*, 576 U.S. at 602—are intervening authority that not only *permit* us to entertain a facial challenge outside of the First Amendment context, but actually *require* us to repudiate our prior cases sustaining the Analogue Act against as-applied vagueness challenges. *See Lotes Co. v. Hon Hai Precision Indus. Co.*, 753 F.3d 395, 405 (2d Cir. 2014) (explaining that one panel of our Court may not usually overrule another unless “an intervening Supreme Court decision [has] cast[] doubt on our controlling precedent” (quoting *In re Zarnel*, 619 F.3d 156, 168 (2d Cir. 2010))). They claim that *Johnson* and its progeny establish a new framework for facial vagueness challenges under which (1) every application of the Analogue Act is unconstitutional and (2) in any case, the existence of some straightforward applications cannot save the statute from invalidation. We conclude that none of those decisions suggests that we may (or should) depart from our prior decisions upholding the Analogue Act.

First, we decided *Demott* after the Supreme Court had already published *Johnson* and *Dimaya*. Indeed, our decision to reject the defendants’ as-applied vagueness challenge to the Analogue Act’s “substantial similarity” requirement

relied in part on those cases' explication of vagueness doctrine. *See Demott*, 906 F.3d at 237 (“[A]s the Supreme Court has recently explained, . . . ‘non-numeric,’ ‘qualitative standard[s]’ abound in our law, and are not so inherently problematic as to independently render a statute void for vagueness.” (quoting *Dimaya*, 138 S. Ct. at 1215)). *Demott* also affirmed the continuing vitality of our prior case law “uph[olding] the Analogue Act against vagueness challenges.” *Id.* In other words, *Johnson* and *Dimaya* are not intervening authority at all.

Second, and more importantly, the “exceptional circumstances” that justified *Johnson*’s extraordinary facial invalidation are not present here. *See Copeland*, 893 F.3d at 111 n.2. *Demott*, which concerned only an as-applied challenge to the Analogue Act’s “substantially similar” requirement, did not call on us to expressly distinguish that statutory provision from those that *Johnson* and its progeny invalidated as facially vague. That question is squarely before us now, and we conclude that the concern that motivated the Supreme Court’s rulings in *Johnson*, *Dimaya*, and *Davis* is inapplicable to the Analogue Act. Each of those decisions invalidated a statute that required courts to apply the “categorical approach”—that is, to estimate the degree of risk posed by the imagined “idealized ordinary case” of a criminal offense, abstracted from the defendant’s

actual conduct. *Johnson*, 576 U.S. at 604. In each case, it was not the laws' employment of qualitative standards, but rather those standards' application to a "judge-imagined abstraction," that rendered them unconstitutionally vague. *Johnson*, 576 U.S. at 598; *see also Dimaya*, 138 S. Ct. at 1215–16.

In *Johnson*, the Court explained that its holding does not call into "doubt the constitutionality of laws that call for the application of a qualitative standard such as 'substantial risk' to *real-world conduct*." 576 U.S. at 604 (emphasis added). To the contrary, it recognized that "the law is full of instances where a man's fate depends on his estimating rightly some matter of degree." *Id.* (internal quotation marks and alteration omitted). It is only when such a qualitative standard "conspire[s]" with an ordinary-case requirement that the statute at issue "produces more unpredictability and arbitrariness than the Due Process Clause tolerates." *Id.*

The Analogue Act harbors no such conspiracy. We have recognized that determining whether a substance is "substantially similar" to another "inevitably involves a degree of uncertainty," *Demott*, 906 F.3d at 237 (citing *United States v. Makkar*, 810 F.3d 1139, 1143 (10th Cir. 2015) (Gorsuch, J.)). But the factfinder in an Analogue Act prosecution applies its qualitative standard exclusively to a defendant's real-world conduct. Neither the Supreme Court nor our Court has

ever extended the reasoning in *Johnson* and its progeny to invalidate a statute that does not require application of the categorical approach. Rather, this Court has expressly cabined the *Johnson* reasoning to statutes that do. See *Copeland*, 893 F.3d at 111 n.2 (suggesting that *Johnson*'s license to strike down a "criminal statute . . . as facially vague even where it has some valid applications" extends only to the "exceptional circumstances" present in that case and its progeny).

In an effort to bring this case within *Johnson*'s narrow ambit, Defendants insist that the Analogue Act *does* "possess[] the same two features that warranted the Supreme Court's intervention" in that case. Appellants' Br. at 30. This is so, they argue, because the Analogue Act first imposes a qualitative "substantially similar" standard, and second requires a defendant to know in advance a "jury-imagined opinion of whether a substance is a controlled-substance analogue." *Id.* at 32. But this putative second problem—despite Defendants' artful attempt to mirror *Johnson*'s concern over a "judge-imagined abstraction"—is nothing more than a restatement of the first, and certainly not equivalent to the application of the categorical approach. That an Analogue Act defendant is subject to a jury's understanding of substantial similarity is simply one more (constitutionally permissible) instance in which "a man's fate depends on his estimating rightly

some matter of degree.” *Johnson*, 576 U.S. at 604 (internal quotation marks and alteration omitted); see also *Demott*, 906 F.3d at 237 (emphasizing that “non-numeric” and “qualitative” standards “are not so inherently problematic as to independently render a statute void for vagueness”). The key to the Act’s constitutionality under *Johnson* is that whoever applies its “substantial similarity” standard—whether a potential defendant weighing the legality of his conduct *ex ante*, or a juror doing so *ex post*—does so in connection with real-world conduct. The Analogue Act imposes nothing resembling an “ordinary case” requirement; it calls upon jurors to determine only whether the *actual* substance at issue is substantially similar in both structure and effect to an *actual* scheduled substance. In sum, Defendants’ contention that the Analogue Act “presents the same problems as the application of the categorical approach,” Appellants’ Br. at 31, is without merit.⁷

⁷ The two circuits to have considered facial vagueness challenges to the Analogue Act since *Johnson* have reached the same conclusion. *United States v. Palmer*, 917 F.3d 1035, 1038 (8th Cir. 2019) (rejecting a facial vagueness challenge based on *Johnson* in part “[b]ecause we do not apply the categorical approach under the Analogue Act.”); *United States v. Larson*, 747 F. App’x 927, 930 (4th Cir. 2018) (unpublished decision) (rejecting an unpreserved facial challenge to the Analogue Act on plain error review but declining to rule definitively on the Act’s constitutionality).

II. Defendants' Sufficiency Challenge

Defendants next challenge the sufficiency of the government's evidence to prove their knowledge that they possessed or distributed a controlled substance analogue.⁸ We review challenges to the sufficiency of trial evidence *de novo*. *United States v. Lyle*, 919 F.3d 716, 737 (2d Cir. 2019). In so doing, we view the evidence in the light most favorable to the Government with all reasonable inferences resolved in the Government's favor. *United States v. Anderson*, 747 F.3d 51, 60 (2d Cir. 2014). We must uphold the jury's verdict "if *any* rational trier of fact could have found the essential elements of the crime had been proved beyond a reasonable doubt." *United States v. Valle*, 807 F.3d 508, 515 (2d Cir. 2015) (emphasis added). We therefore "assum[e] that the jury resolved all questions of witness credibility . . . in favor of the prosecution," *United States v. Abu-Jihaad*, 630 F.3d 102, 134 (2d Cir. 2010), and "defer to the jury's determination of the weight of the evidence and the credibility of the witnesses, and to the jury's choice of the competing inferences that can be drawn from the evidence," *United States v. Best*, 219 F.3d 192, 200 (2d Cir. 2000) (internal quotation marks omitted).

⁸ Defendants do not challenge the sufficiency of the evidence to prove that the substances in question were controlled substance analogues, and their counsel conceded at oral argument that such an argument would lack merit.

In prosecutions involving controlled substance analogues, the government may satisfy 21 U.S.C. § 841(a)(1)'s knowledge requirement in either of two ways: First, it can present evidence that the defendant “knew that the substance with which he was dealing is some controlled substance—that is, one actually listed on the federal drug schedules or treated as such by operation of the Analogue Act—regardless of whether he knew the particular identity of the substance.” *McFadden*, 576 U.S. at 194. Second, it can present evidence that the defendant knew that the substance has a chemical structure and pharmacological effects substantially similar to or greater than, those of a controlled substance in schedule I or II.⁹ *Id.* at

⁹ *McFadden* explains these alternative methods of proving knowledge in several places. In one such articulation of the second route, *McFadden* states that knowledge “can be established by evidence that the defendant knew the specific analogue he was dealing with, even if he did not know its legal status as an analogue.” 576 U.S. at 194. In isolation, this language could be read to suggest that a defendant who knows the identity of the analogue substance, but none of the features that make it an analogue, has the requisite knowledge for conviction. Indeed, a nonprecedential summary order of this Court, reviewing jury instructions for plain error, could without context be understood to endorse such a reading. *See United States v. Smutek*, 730 F. App'x 18, 22 (2d Cir. 2018) (“The district court correctly instructed the jury that the government was required to prove beyond a reasonable doubt that Smutek knew: (1) that Potion 9 contained a controlled substance analogue, even if he did not know the identity of the substance, or (2) that Potion 9 contained 1,4 butanediol, even if he did not know that 1,4 butanediol was a controlled substance analogue.”). But as the subsequent sentences of *McFadden*—as well as other passages of the decision—make clear, the government must either prove that the defendant knew that the substance at issue was controlled or that it had the chemical and pharmacological features that make it an analogue. 576 U.S. at 194–95 (“The Analogue Act defines a controlled substance analogue by its features A defendant who possesses a substance with knowledge of those features knows all of the facts that make

189, 193–95. “Although the Government must prove that a defendant knew that the substance in question was ‘a controlled substance’ under federal law, the Government need not introduce direct evidence of such knowledge. As with prosecutions involving substances actually listed on the drug schedules, the Government may offer circumstantial evidence of that knowledge.” *Id.* at 195 n.3. “Circumstantial evidence could include, for example, a defendant’s concealment of his activities, evasive behavior with respect to law enforcement, knowledge that a particular substance produces a ‘high’ similar to that produced by controlled substances, and knowledge that a particular substance is subject to seizure at customs.” *Id.* at 192 n.1.

The government presented ample direct and circumstantial evidence to prove that Defendants knowingly possessed and distributed controlled substance analogues. First, as Defendants admit on appeal, “[e]veryone material to the

his conduct illegal”); *id.* at 196 (“Knowledge [that a substance is controlled] can be established . . . either by knowledge that a substance is listed or treated as listed by operation of the Analogue Act or by knowledge of the physical characteristics that give rise to that treatment. (internal citation omitted)); *id.* at 189 (“The knowledge requirement is also met if the defendant knew the specific features of the substance that make it a controlled substance analogue.” (internal quotation marks omitted)); *cf. also id.* at 198 (Roberts, C.J., concurring in part) (“[A] defendant needs to know more than the identity of the substance; he needs to know that the substance is *controlled*.” (emphasis in original)).

transaction . . . knew [Defendants'] product was sold with the intent that the consumer would ingest it for the purpose of getting high." Appellants' Br. at 4. Numerous witnesses testified that Defendants sought chemicals to produce a "buzz" or "high" similar to or stronger than the one induced by smoking marijuana, and that Defendants and their employees at times smoked their product themselves to test its potency.¹⁰ But despite their admitted knowledge that their product was intended to be smoked, Defendants distributed it in packages labeled "not for human consumption," tracking the precise language of the Analogue Act. *See* 21 U.S.C. § 813.

This purposeful misdirection was far from the only evidence that Defendants knew their product was both similar to other controlled substances and controlled in its own right. One former employee testified that each time the active chemical in one of Defendants' products was added to the federal drug schedules, Defendants would replace it with another that they expected to produce a similar high. The government also presented evidence that Defendants labeled their products with designs evoking the use of controlled substances,

¹⁰ Employees testified that Real Feel at times produced products incorporating a greater quantity of raw chemical to mimic the effects of a greater quantity of THC, the primary psychoactive chemical in marijuana.

including, in Requena's own words, "a Mule/Donkey that is smoked out" and a "[r]eference to AMC's Breaking Bad"—a television show about the manufacture and distribution of methamphetamine. G.A. 294. Employee testimony suggested that this was no innocent coincidence—one worker recalled that Raymond openly informed Real Feel employees that "what we make . . . [is] more than questionable." Trial Tr. at 1070.

Evidence of the extreme precautions Defendants took to conceal the nature of their operations further suggests that Defendants knew their product incorporated controlled substance analogues. The government presented evidence that not only did Defendants label their product using the language of the Analogue Act, they also maintained a list of "words not to say!" including "smoke" and "analog," G.A. 245, and they instructed their salespeople not to use language suggesting that customers should smoke or otherwise consume their products.

Witnesses also testified that although Defendants initially had their chemical supplier ship the raw synthetic cannabinoids directly to the warehouse where it was incorporated into product for sale, they eventually had these chemicals shipped to post office boxes or employees' homes—and in one case to

an employee's sister's place of business—instead.¹¹ See *United States v. O'Brien*, 926 F.3d 57, 80–81 (2d Cir. 2019) (describing a defendant's instructions to ship drugs to multiple associates' addresses and post office boxes as probative of his knowledge that the drugs are controlled). Moreover, documents collected at Defendants' warehouse suggest that invoices accompanying at least some of the raw chemical shipments misidentified the shipments' contents and price. See *id.* at 81 (“The intercepted packages . . . bore labels that misrepresented their contents as various uncontrolled substances, when in fact they contained [the controlled substances] that O'Brien had ordered.”). And once Real Feel had incorporated the raw chemicals into finished product, Raymond insisted that employees ship it to customers from multiple UPS Stores surrounding Real Feel's base of operations because “he didn't want UPS coming directly to” the warehouse. Trial Tr. 1063.

Other evidence suggested that Defendants attempted to conceal their product entirely from public view. Photographic evidence and testimony indicated that at an annual trade show for smoke shops, Defendants intentionally did not display any of their principal product, exhibiting glassware instead.

¹¹ Evidence showed that Requena obfuscated the purpose of Defendants' business while completing the paperwork to open those post office boxes, a tactic he also employed when opening Real Feel's bank accounts.

Former employees also testified that Raymond filmed a reality-television-style video to promote himself and Real Feel, but instructed workers to conceal raw synthetic cannabinoids and finished products from view—and instead to display glassware at the workstations where they typically incorporated raw synthetic cannabinoids into product for sale.

Moreover, the government presented ample evidence that law enforcement activity put Defendants on notice that they were dealing in controlled substances. Defendants' accountant testified that though Defendants knew customs frequently seized chemicals en route from their supplier in China, they made no effort to recover them and, in at least one case, filed a response voluntarily abandoning a shipment. *See McFadden*, 576 U.S. at 192 n.1. When the DEA raided Defendants' warehouses in February 2014, agents seized all raw chemical and finished product on the premises and left a copy of the search warrant, which authorized the seizure of items related to a conspiracy to manufacture and distribute a controlled substance analogue as defined in 21 U.S.C. §§ 802(32) and 813. Employees testified that though Defendants continued to operate the business following the raid, they never attempted to recover the (very valuable) seized material.

Finally, the government also presented direct evidence that Defendants knew the specific structure and pharmacological effects of the chemicals in the products they sold. Former Real Feel employees testified that Defendants, with the assistance of their employees, researched state and federal drug laws—including provisions on controlled substance analogues. Among research materials recovered from Defendants' electronic files was a DEA publication detailing the chemical structure and pharmacological effects of two of the synthetic cannabinoids at issue in this case, noting that each "may be treated as a 'controlled substance analogue'" pursuant to 21 U.S.C. § 813. G.A. 258.

In light of the foregoing, we easily conclude that the jury had sufficient evidence to infer that Defendants knew they were dealing in a controlled substance.

III. Defendants' Challenge Regarding Expert Testimony

Defendants also argue that the district court should have excluded testimony by the government's two expert witnesses, Dr. Michael Van Linn and Dr. Jordan Trecki, as to whether the synthetic cannabinoids at issue were "substantially similar" in structure and pharmacological effect to controlled substances. They argue that because there is no objective chemical or

pharmacological standard for substantial similarity, the district court should not have admitted expert testimony on that question under the principles articulated in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592–94 (1993).

We review a district court’s decision to admit expert testimony for abuse of discretion. *United States v. Williams*, 506 F.3d 151, 159–60 (2d Cir. 2007). Our review is “highly deferential,” and we will sustain the district court’s decision unless it is “manifestly erroneous.” *Restivo v. Hessemann*, 846 F.3d 547, 575 (2d Cir. 2017) (quoting *Lore v. City of Syracuse*, 670 F.3d 127, 155 (2d Cir. 2012)). Pursuant to Federal Rule of Evidence 702, a district court exercises a gatekeeping function to ensure that a testifying expert’s “scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue,” that the testimony is “based on sufficient facts or data,” and that such testimony is “the product of reliable principles and methods . . . reliably applied . . . to the facts of the case.” Fed. R. Evid. 702. Defendants’ challenge focuses on the last of these: they contend that Dr. Van Linn’s and Dr. Trecki’s opinions of whether one substance is “substantially similar” to another are “not subject to verification through any means,” and lack “any known error rate, possible means of replicating or testing the correctness of the opinions, testing conditions, or

evidence of peer review,” and so should have been excluded. Appellants’ Br. 47.

In assessing the reliability of an expert’s methodology, the district court may consider, among other factors, “(1) whether a theory or technique has been or can be tested; (2) ‘whether the theory or technique has been subjected to peer review and publication;’ (3) the technique’s ‘known or potential rate of error’ and ‘the existence and maintenance of standards controlling the technique’s operation;’ and (4) whether a particular technique or theory has gained general acceptance in the relevant scientific community.” *Williams*, 506 F.3d at 160 (quoting *Daubert*, 509 U.S. at 593–94 (1993)). But these factors are by no means a “definitive checklist or test.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 150 (1999). Rather, “the gatekeeping inquiry must be tied to the facts of a particular case,” and we defer “as much to the trial court’s decisions about how to determine reliability as to its ultimate conclusion.” *Id.* at 150, 152 (internal quotation marks omitted); *see also United States v. Romano*, 794 F.3d 317, 331 (2d Cir. 2015) (“Whether *Daubert*’s specific factors are . . . reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine.” (internal quotation marks and alterations omitted)).

We conclude that the district court did not abuse its discretion in permitting

the government's experts to opine that the synthetic cannabinoids at issue are substantially similar in structure and pharmacological effect to scheduled substances. Although substantial similarity is not *itself* a scientific standard, the district court had ample basis to conclude that the experts' opinions were nonetheless "the *product* of reliable principles and methods . . . applied . . . to the facts of the case." Fed. R. Evid. 702(c) (emphasis added). In explaining his conclusion that the substances at issue had a substantially similar chemical structure to scheduled substances, Dr. Van Linn described how chemists depict the makeup and structure of organic molecules using two-dimensional diagrams. He proceeded to use such diagrams to compare the structures of each of the synthetic cannabinoids at issue with their alleged scheduled analogues. Likewise, Dr. Trecki explained various ways pharmacologists assess a substance's effect on the central nervous system—including visual examination, *in vitro* binding assays, *in vitro* functional assays, animal trials, and case reports—and referred to these methods to compare the hypothesized or observed pharmacological effects of each of the synthetic cannabinoids at issue with those of allegedly similar scheduled substances.

Admitting that the above methodologies are reliable, Defendants concede

that it was appropriate to permit the experts to describe their analytical methods, as well as the specific ways in which the substances at issue are similar to and different from scheduled substances. They challenge only the experts' application of these methods to draw a conclusion on the ultimate question of substantial similarity.¹² But even this limited challenge must fail.

Defendants are correct that the actual determination of substantial similarity is not a scientific one.¹³ But as they rightly concede, the government's experts' "opinions . . . regarding the substantial similarity of [the] substances" in this case

¹² Of course, expert testimony is not objectionable "merely because it 'embraces an ultimate issue' to be decided by the factfinder." *Lore*, 670 F.3d at 155 (quoting Fed. R. Evid. 704(a)). Indeed, such testimony is sometimes critical in helping a jury understand highly technical evidence. In analogue prosecutions, for instance, many jurors might find the sort of chemical and pharmacological evidence necessary to prove that a substance is a controlled substance analogue all but inscrutable, absent expert guidance of this sort.

¹³ We note parenthetically that a district court could well abuse its discretion by permitting an expert to affirm that "substantial similarity" *is* a matter of objective scientific fact rather than a subjective conclusion based on a conventional understanding of the words "substantial" and "similar." The experts in this case, however, did no such thing. To the contrary, Dr. Van Linn testified that "substantially similar" is "not a scientific term" and "not a scientific question," acknowledging that he reached an understanding of its meaning after looking up its constituent words in a standard dictionary. Trial Tr. 1539. Likewise, Dr. Trecki testified that "substantial similarity" is "just a plain English term" and "not scientific," explaining that he, too, had used a dictionary to determine its meaning. Tr. 1666–67. And in its instructions, the district court admonished the jury not to "substitute [the experts' opinions] for your own reason, judgment, and common sense" because "[t]he determination of the facts in this case rests solely with you." A. 274.

are “*based on . . . scientific facts or findings.*” Appellants’ Br. 48 (emphasis added). And the inferential step between the experts’ uncontroversial scientific observations and the ultimate question of whether the substances have “substantially similar” properties is not unduly “speculative[,] conjectural[,] or based on assumptions that are so unrealistic and contradictory as to suggest bad faith.” *Zerega Ave. Realty Corp. v. Hornbeck Offshore Transp., LLC*, 571 F.3d 206, 214 (2d Cir. 2009) (internal quotation marks and alteration omitted). Instead, these experts’ opinions on substantial similarity are “the product of reliable principles and methods . . . reliably applied to the facts of the case,” precisely as Rule 702 requires. Fed. R. Evid. 702; *see also Restivo*, 846 F.3d at 576 (explaining that under Rule 702, scientists “may express professional opinions that fall short of definitive proof” (internal quotation marks omitted)). Accordingly, we reject Defendants’ claim that the district court abused its discretion.¹⁴

¹⁴ To our knowledge, every Court of Appeals to have considered a similar question has reached the same conclusion. *See, e.g., United States v. Carlson*, 810 F.3d 544, 553 (8th Cir. 2016) (affirming the district court’s discretion to admit expert testimony on substantial similarity “based on” evidence, specialized knowledge, literature review, and discussions with other scientists); *cf. United States v. Galecki*, 932 F.3d 176, 183, 186 (4th Cir. 2019) (declaring that an expert’s testimony that a putative analogue was not “substantially similar” to a scheduled substance would have “violated no Federal Rules of Evidence”).

IV. Defendants' Challenge to the Jury Instructions

Defendants further contend that the district court erred in instructing the jury that it must unanimously agree that at least one of the charged synthetic cannabinoids qualifies as a controlled substance analogue, but that it need not unanimously agree on precisely which substances so qualify. Since Defendants did not object to the district court's instructions before the jury retired to deliberate, we review the jury instructions for plain error. *See* Fed. R. Crim. P. 30(d). Under this standard, we will disturb the district court's decision only where "(1) there is an error; (2) the error is clear or obvious, rather than subject to reasonable dispute; (3) the error affected the appellant's substantial rights, which in the ordinary case means it affected the outcome of the district court proceedings; and (4) the error seriously affect[s] the fairness, integrity or public reputation of judicial proceedings." *United States v. Marcus*, 560 U.S. 258, 262 (2010). Because we hold that the district court's instruction was not erroneous, Defendants' challenge fails at the first step of this analysis.

The Sixth Amendment to the Constitution guarantees that a federal criminal jury "cannot convict unless it unanimously finds that the Government has proved each element" of the charged offense. *Richardson v. United States*, 526 U.S. 813, 817

(1999). But a disagreement about “which of several possible sets of underlying brute facts make up a particular element”—in other words, “which of several possible means the defendant used to commit an element of the crime”—does “not matter as long as all 12 jurors unanimously conclude[] that the Government ha[s] prove[d] the necessary related element” *Id.*

Elements, as opposed to “means” or “brute facts,” are “ordinarily listed in the statute that defines the crime.” *Id.*; see also *United States v. O’Brien*, 560 U.S. 218, 225 (2010) (“[W]hether a given fact is an element of the crime . . . is a question for Congress.”). Additional details not set out in the statute typically are not elements even if they seem intuitively central to the commission of an offense. For example, in *Mathis v. United States*, 136 S. Ct. 2243, 2249 (2016), the Supreme Court discussed a hypothetical statute that “requires use of a ‘deadly weapon’ as an element of a crime and further provides that the use of a ‘knife, gun, bat, or similar weapon’ would all qualify.” The Court explained that because only the use of a deadly weapon is an *element*—and the illustrative list “merely specifies diverse means of satisfying [that] element”—a “jury could convict even if some jurors concluded that the defendant used a knife while others concluded he used a gun, so long as

all agreed that the defendant used a ‘deadly weapon.’”¹⁵ *Id.* (internal quotation marks and alterations omitted). That said, if “statutory alternatives carry different [maximum or minimum] punishments, then . . . they must be elements.” *Id.* at 2256; *Apprendi v. New Jersey*, 530 U.S. 466, 490 (2000) (“Other than the fact of a prior conviction, any fact that increases the penalty for a crime beyond the prescribed statutory maximum must be submitted to a jury . . .”); *Alleyne v. United States*, 570 U.S. 99, 113–14 (2013) (expanding the rule of *Apprendi* to facts that increase or decrease the prescribed statutory minimum).

Applying these principles to the controlled substance context, we have explained that the type and quantity of drugs involved in a violation of § 841(a) must be submitted to the jury “as an element . . . only in cases where the Government will seek a sentence above” the statutory maximum imposed by § 841(b)(1)(C)—the penalty provision that applies to violations involving schedule I or II controlled substances of “indeterminate” or “unspecified” amount and

¹⁵ This principle applies equally to a statute that leaves the many potential means of fulfilling its elements entirely to the jury’s imagination. See *Descamps v. United States*, 570 U.S. 254, 273 (2013) (“As long as the statute itself requires only an indeterminate ‘weapon,’ . . . [t]he jurors need not all agree on whether the defendant used a gun or a knife or a tire iron . . . because the actual statute requires the jury to find only a ‘weapon.’”).

identity.¹⁶ *United States v. Thomas*, 274 F.3d 655, 660 & nn.2–3 (2d Cir. 2001) (en banc); *see also id.* at 664, 673 (explaining that drug quantity need not be treated as an element where the sentence imposed is within the range authorized by § 841(b)(1)(C)). Otherwise, as long as the jury unanimously agrees that the offense involved some schedule I or II controlled substance, the *specific* nature of that substance has no bearing on the statutory penalty range and, as a result, “[t]he constitutional rule [requiring jury unanimity] does not apply.”¹⁷ *Id.* at 664; *cf. United States v. Reyes*, 13 F.3d 638, 640 (2d Cir. 1994) (recognizing that “[t]he nature of the controlled substance is . . . not an essential element of” a criminal statute

¹⁶ 21 U.S.C. § 841(b)(1)(C) establishes maximum penalties for any violation of § 841(a) involving a schedule I or II controlled substance. Separately, § 841(b)(1)(A) and (B) provide that violations involving *certain specific types and quantities* of schedule I or II substances may carry penalties in excess of those authorized by § 841(b)(1)(C). Under *Apprendi* and *Alleyne*, a district court may not sentence a defendant under these enhanced penalty provisions unless the jury unanimously determines that the offense involved the specific types and quantities of drugs that trigger them. *See Thomas*, 274 F.3d at 673.

¹⁷ Section 841(b)(1)(C)’s generic reference to “a controlled substance in schedule I or II” supports the conclusion that a jury need not agree on a particular controlled substance to convict. 21 U.S.C. § 841(b)(1)(C) (emphasis added). In assessing § 841’s knowledge requirement, *McFadden* put special emphasis on the fact that § 841 prohibits conduct involving “a controlled substance.” 576 U.S. at 191–92. Because the “indefinite article[] ‘a’ means ‘[s]ome undetermined or unspecified particular,’” the Court held that § 841(a)(1) “requires a defendant to know only that the substance he is dealing with is some unspecified substance listed on the federal drug schedules.” *Id.* (citation omitted). The same interpretive principle demands that we treat the language “a controlled substance in schedule I or II” to refer “only” to “some unspecified substance listed on [schedule I or II].”

prohibiting the importation of a “controlled substance”).

In practice, this means that a jury can convict a defendant for violating § 841 even if some jurors believe that the defendant distributed one drug (say, cocaine) and others believe that he actually distributed another (say, heroin).¹⁸ Analogizing to the Supreme Court’s “deadly weapon” example, we have held that a New York statute prohibiting the sale of a “controlled substance” operates in precisely the same way: Under that statute, “if some jurors believed that a defendant had sold cocaine, and others believed that he had sold heroin, they could still agree that he had sold ‘a controlled substance,’ and issue a guilty verdict.” *Harbin v. Sessions*, 860 F.3d 58, 65 (2d Cir. 2017) (citing *Mathis*, 136 S. Ct. at 2249).

But our past decisions have had occasion to distinguish means from elements only in cases involving *scheduled* substances. This case demands that we consider whether, in a § 841 prosecution involving a controlled substance *analogue*, the fact that a particular substance is an analogue becomes an additional element of the offense, or whether a substance’s analogue status is merely one of “various

¹⁸ Cocaine is a schedule II controlled substance. 21 U.S.C. § 812, sched. II(a)(4). Heroin is a schedule I controlled substance. *Id.* § 812, sched. I(b)(10).

factual means of” qualifying as a “controlled substance.” *Mathis*, 136 S. Ct. at 2249. Unsurprisingly, the government takes the latter view. In response, Defendants contend that a putative analogue may not “be treated . . . as a controlled substance” by operation of 21 U.S.C. § 813 unless a jury has first determined unanimously that the same substance meets the statutory definition of “controlled substance analogue” set out in § 802(32). In other words, Defendants argue that even if a jury need not agree on precisely which analogues a defendant manufactured, distributed, or possessed, it must still unanimously agree that each particular substance forming the basis of the conviction does, in fact, qualify as an analogue.

We disagree. We conclude instead that in a prosecution for a violation of 21 U.S.C. § 841(a) subject to the statutory penalties in § 841(b)(1)(C), a substance’s analogue status is nothing more than a means of fulfilling the element that the defendant’s conduct involved a “controlled substance” in schedule I or II. Thus, though a jury must unanimously find that the defendant manufactured, distributed, or possessed with the intent to distribute some schedule I or II controlled substance, it need not unanimously agree on any more specific description of that substance. Just as distributing a scheduled substance is a

potential means of fulfilling that element, so too is distributing an analogue.¹⁹ And just as the specific identity of a scheduled substance is irrelevant to a conviction pursuant to § 841(a) and (b)(1)(C), so too is the specific identity of an analogue.

Our conclusion is rooted in the applicable statutory language and penalty structure. *See Harbin*, 860 F.3d at 64–65. As explained above, the specific nature of a scheduled substance is not an element of the offense set out in § 841(a). Nothing in the Analogue Act’s language indicates that it adds a new element to that offense when the alleged conduct involves a controlled substance analogue. To the contrary, the instruction to “treat” an analogue as a schedule I controlled substance “for the purposes of any Federal law” strongly suggests the Analogue Act merely provides an alternative means of committing controlled substance offenses already defined elsewhere. 21 U.S.C. § 813(a). As the Supreme Court pointedly observed in *McFadden*, “[t]he Analogue Act does not alter [§ 841(a)(1)].” 576 U.S. at 193–94.

Following § 813’s instruction to treat a controlled substance analogue as a controlled substance, Congress could rewrite § 841—insofar as the offense

¹⁹ Indeed, though not relevant here, a jury could convict a defendant for violating § 841 even if some jurors believed the defendant distributed an analogue and others believed he distributed a substance actually listed on schedule I or II.

involves an analogue—to make it unlawful to “knowingly or intentionally . . . manufacture, distribute, or dispense, or possess with intent to manufacture, distribute, or dispense,” 21 U.S.C. § 841(a), “a substance[,] . . . the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II [and] . . . which has [an] effect on the central nervous system that is substantially similar to or greater than [that] of a controlled substance in schedule I or II,” *id.* § 802(32)(A). As *McFadden* explained, phrases set off with the “indefinite article ‘a’” refer to “some undetermined or unspecified particular.” *McFadden*, 576 U.S. at 191–92 (brackets omitted). Accordingly, even when combined with the Analogue Act, § 841 requires only that the jury find an “undetermined or unspecified” substance with the characteristics set out in § 802(32)(A).

The applicable penalty provisions point to the same conclusion. Since all analogues are treated as schedule I controlled substances, § 841(b)(1)(C) imposes the same penalties no matter what analogue is involved in the offense. It follows that an analogue’s specific identity, which has no bearing on a defendant’s sentencing range, is a means rather than an additional element. *Cf. Harbin*, 860 F.3d at 65 (“[That] [t]he law’s penalty provisions . . . prescribe the same narrow range

of penalties . . . no matter which controlled substance a defendant has sold . . . [aligns] with our reading . . . that each controlled substance is a mere ‘means’ of violating the statute, not a separate alternative element.”).

Resisting this logic, Defendants insist that an unscheduled substance “is only an analogue at the time of the jury’s proclamation,” and that a jury must therefore make this proclamation unanimously. Appellants’ Br. 54. But their assumption that “a substance is not an analogue until a jury unanimously finds that it is,” Reply Br. 24, begs the question. Not every fact that calls for a qualitative determination based on conflicting evidence is an element.²⁰ After all, a substance’s analogue status is no more dependent on a “jury’s proclamation” than an implement’s “deadly weapon” status in the hypothetical posed in *Mathis*. See *Mathis*, 136 S. Ct. at 2249. And in that case, the Supreme Court clearly envisioned that a jury harboring disagreements about the particular deadly weapon involved could convict without taking separate, unanimous votes on whether each

²⁰ In their briefing and at oral argument, Defendants claimed that a footnote in our decision in *Ansal di* identified “substantial similarity” as an element of an offense involving an analogue. See *Ansal di*, 372 F.3d at 123 n.2. But the cited passage is a summary of the defendants’ briefing in that case, not a declaration of the law. While an analogue-based prosecution *does* require unanimous agreement that a defendant’s offense involved a substance substantially similar to a scheduled substance, individual jurors need not agree on precisely which substance bears the requisite similarity.

individual juror's chosen implement qualified as a deadly weapon. *See id.*; *see also Descamps v. United States*, 570 U.S. 254, 273 (2013) (“[A] court blessed with sufficient time and imagination could devise a laundry list of potential ‘weapons’ [including] (for starters) grenades, pipe bombs, spears, tire irons, BB guns, nunchucks, and crossbows.”). Taking Defendant's theory to its logical conclusion, *Mathis's* declaration that “a jury need not find . . . a particular item,” would extend only to the knives, guns, and bats listed explicitly in the statute. 136 S. Ct. at 2249. We strenuously doubt that the Supreme Court meant, but declined to make express, that the specific weapon involved in the crime vaults from means to element status as soon as a single juror concludes that a defendant used not a “knife, gun, [or] bat,” but instead a “similar weapon.” *Id.* The same logic applies to analogues. As such, we reject Defendants' argument that a jury must unanimously identify particular analogues before individual jurors may treat those analogues as means of fulfilling “the necessary related element” — that is, the involvement of a controlled substance. *Richardson*, 526 U.S. at 817.

For the foregoing reasons, the district court's instruction regarding unanimity was not error, plain or otherwise.

V. Defendants' Sentencing Challenge

Defendants next argue that the trial court committed procedural error by failing to determine before sentencing which of the six synthetic cannabinoids at issue qualified as a controlled substance analogue. They contend that in the absence of such findings, the district court's calculation of the total quantity of illegal substances in Defendants' possession could not have been proper. But these arguments, too, are unavailing. Although a district court must rule on any material dispute regarding the presentence report ("PSR"), Fed. R. Crim. P. 32(i)(3)(B), it "satisfies its obligation to make the requisite specific factual findings when it explicitly adopts the factual findings set forth in the [PSR] . . . at the sentencing hearing or in the written judgment it files later." *United States v. Molina*, 356 F.3d 269, 275–76 (2d Cir. 2004). "Facts in support of a sentencing calculation need only be proven by a preponderance of the evidence, and the district court's findings will not be disturbed unless clearly erroneous." *United States v. Halloran*, 821 F.3d 321, 341 (2d Cir. 2016).

Here, the district court explicitly adopted the PSR's factual findings, which identified the relevant substances as controlled substance analogues. The court likewise identified all six of the charged substances in a post-trial order as "the

controlled substance analogues defendants conspired to possess with the intent to distribute and to distribute” in its decision following a pre-sentencing evidentiary hearing. G.A. 315. The district court heard more than sufficient testimony at trial to find that each of these substances was a controlled substance analogue by a preponderance of the evidence. And because the resolution of disputed facts at sentencing is a task for the district court alone, the fact that the jury made no explicit findings as to which specific cannabinoids qualified as controlled substance analogues is irrelevant. We therefore detect no error in the sentence imposed by the district court.

VI. Defendants’ Conviction for Money Laundering

Finally, Defendants ask us to extend any relief granted based on the foregoing to their convictions for money laundering, which are premised in part on their drug violation. Since we have determined that Defendants are entitled to no relief in connection with their conviction for conspiracy to distribute controlled substance analogues, we need not revisit their convictions for money laundering.

CONCLUSION

In sum, we hold that:

- (1) The Analogue Act's instruction to treat a substance with chemical and pharmacological properties "substantially similar" to those of a scheduled substance as a controlled substance in schedule I is not unconstitutionally vague on its face, the Supreme Court's decisions in *Johnson*, *Dimaya*, and *Davis* notwithstanding.
- (2) The government's evidence was sufficient to prove beyond a reasonable doubt that Defendants knew they distributed a controlled substance.
- (3) The district court did not abuse its discretion when it allowed the government's experts to testify that the synthetic cannabinoids at issue had chemical and pharmacological properties "substantially similar" to those of controlled substances in schedule I.
- (4) The district court correctly instructed the jury that it need not unanimously agree on which of the six synthetic cannabinoids charged in the indictment meet the statutory definition of a controlled substance analogue.
- (5) The district court made all of the factual findings necessary to calculate Defendants' base offense level at sentencing.
- (6) Because Defendants are entitled to no relief in connection with their drug conviction, their money laundering conviction likewise stands.

Accordingly, we AFFIRM the judgment of the district court.