PUBLISHED

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 13-4349

UNITED STATES OF AMERICA,

Plaintiff - Appellee,

v.

STEPHEN DOMINICK MCFADDEN, a/k/a Stephen Domin McFadden,

Defendant - Appellant.

Appeal from the United States District Court for the Western District of Virginia, at Charlottesville. Glen E. Conrad, Chief District Judge. (3:12-cr-00009-GEC-1)

Argued: March 19, 2014 Decided: May 21, 2014

Before TRAXLER, Chief Judge, and WILKINSON and KEENAN, Circuit Judges.

Affirmed by published opinion. Judge Keenan wrote the opinion, in which Chief Judge Traxler and Judge Wilkinson joined.

ARGUED: J. Lloyd Snook, III, SNOOK & HAUGHEY, PC, Charlottesville, Virginia, for Appellant. Jean Barrett Hudson, OFFICE OF THE UNITED STATES ATTORNEY, Charlottesville, Virginia, for Appellee. **ON BRIEF**: Timothy J. Heaphy, United States Attorney, Roanoke, Virginia, Ronald M. Huber, Assistant United States Attorney, OFFICE OF THE UNITED STATES ATTORNEY, Charlottesville, Virginia, for Appellee.

BARBARA MILANO KEENAN, Circuit Judge:

This appeal concerns a defendant's convictions involving the sale of "designer drugs," in violation of the Controlled Substance Analogue Enforcement Act of 1986 (the Act), 21 U.S.C. §§ 802(32)(A), 813. Stephen D. McFadden was convicted by a jury of nine charges stemming from his distribution of substances that the government alleged were prohibited by the Act. On appeal, McFadden primarily asserts that the Act is unconstitutionally vague as applied to him, that the district court abused its discretion in making certain evidentiary rulings at trial, and that the government failed to prove that the substances McFadden distributed qualified as controlled substance analogues under the Act. Upon our review, we affirm the district court's judgment.

I.

Before addressing the facts of this case and McFadden's challenges to his convictions, we first provide a brief overview of the Act. Congress enacted the Act to prevent "underground chemists" from creating new drugs that have similar effects on the human body as drugs explicitly prohibited under the federal drug laws. See United States v. Klecker, 348 F.3d 69, 70 (4th Cir. 2003); see also United States v. Hodge, 321 F.3d 429, 432, 437 (3d Cir. 2003) (purpose of the Act is to "make illegal the

production of designer drugs and other chemical variants of listed controlled substances that otherwise would escape the reach of the drug laws"). To achieve that purpose, Congress mandated that a "controlled substance analogue," when intended for human consumption, be treated under federal law as a Schedule I controlled substance. 21 U.S.C. § 813.

Subject to certain exceptions not at issue in this case, a "controlled substance analogue" is defined under the Act as:

> a substance-
>
> (i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II;
>
> (ii) which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II; or
>
> (iii) with respect to a particular person, which such person represents or intends to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II.

21 U.S.C. § 802(32)(A).

Accordingly, an individual may be convicted for an offense involving a controlled substance analogue under 21 U.S.C. § 841 if the government establishes that: (1) the alleged analogue substance has a chemical structure that is substantially similar to the chemical structure of a controlled substance classified

under Schedule I or Schedule II (the chemical structure element);[1] (2) the alleged analogue substance has an actual, intended or claimed stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than such effect produced by a Schedule I or Schedule II controlled substance (the pharmacological similarity element); and (3) the analogue substance is intended for human consumption (the human consumption element). See Klecker, 348 F.3d at 71 (construing 21 U.S.C. §§ 802(32)(A), 813).

II.

In July 2011, police investigators in the Charlottesville, Virginia area began investigating the use and distribution of certain synthetic stimulants commonly known as "bath salts." When ingested into the human body, bath salts are capable of producing similar effects as certain controlled substances, including cocaine, methamphetamine, and methcathinone.

The police investigation revealed that bath salts were being sold from a video rental store in Charlottesville, which was owned and operated by Lois McDaniel. Using confidential

[1] Controlled substances are classified under one of five schedules, which are set forth in 21 U.S.C. § 812 and 21 C.F.R. §§ 1308.11 through 1308.15.

informants, investigators purchased bath salts from McDaniel, which later were analyzed by the United States Drug Enforcement Administration (DEA). The chemical analysis performed by the DEA showed that these bath salts contained 3,4-methylenedioxypyrovalerone (MDPV) and 3,4-methylenedioxymethcathinone (methylone, or MDMC). Government agents later seized from McDaniel's store additional bath salts that contained a combination of MDPV, methylone, and 4-methyl-ethylcathinone (4-MEC).

McDaniel agreed to cooperate with the investigators, and informed them that the bath salts she distributed from her store were supplied by McFadden. At the investigators' direction, McDaniel initiated recorded telephone conversations with McFadden in which she placed orders for bath salts. During these conversations, McFadden discussed the potency and duration of the "high" experienced by users of the substances he was distributing. He also compared the effects of those substances to certain controlled substances, including cocaine and methamphetamine.

As a result of these transactions, investigators received bath salts supplied by McFadden on five separate occasions. The DEA's analysis showed that two batches of these bath salts contained 4-MEC, MDPV, and methylone. The three other batches

contained 4-MEC, but not MDPV or methylone.[2] Based on the findings of this investigation, the grand jury issued a superseding indictment in November 2012, charging McFadden with nine offenses, including one count of conspiracy to distribute substances containing the alleged controlled substance analogues 4-MEC, MDPV, and methylone (collectively, the alleged CSAs), and eight additional counts of distributing these substances.[3]

The four-day jury trial focused primarily on the issue whether 4-MEC, MDPV, and methylone constitute controlled substance analogues under the Act. To prove the chemical structure element, the government presented the testimony of Dr. Thomas DiBerardino, a chemist employed by the DEA, who qualified as an expert in the field of chemical structures of drugs.

[2] During the course of the government's investigation, the DEA, under its emergency temporary scheduling powers in 21 U.S.C. § 811(h), classified MDPV and methylone as Schedule I controlled substances. Schedules of Controlled Substances, 76 Fed. Reg. 65371, 65372 (amending 21 C.F.R. § 1308.11) (Oct. 21, 2011). The government did not allege that McFadden distributed MDPV or methylone after this classification.

[3] The indictment contained the following charges: conspiracy to distribute a substance or mixture containing the controlled substance analogues 4-MEC, MDPV, and methylone, in violation of 21 U.S.C. §§ 841(a)(1), (b)(1)(c) and 846 (Count One); two counts of distribution of a substance or mixture containing MDPV and methylone, in violation of 21 U.S.C. §§ 841(a)(1) and (b)(1)(c) (Counts Two and Three); three counts of distribution of a substance or mixture containing 4-MEC, MDPV, and methylone, in violation of 21 U.S.C. §§ 841(a)(1) and (b)(1)(c) (Counts Four, Five, and Six); and three counts of distribution of a substance or mixture containing 4-MEC, in violation of 21 U.S.C. §§ 841(a)(1) and (b)(1)(c) (Counts Seven, Eight, and Nine).

Using chemical diagrams as demonstrative exhibits, Dr. DiBerardino testified that the chemical structures of 4-MEC and MDPV are each substantially similar to methcathinone, a Schedule I controlled substance. Dr. DiBerardino further testified, based on the chemical diagrams, that the chemical structure of methylone is substantially similar to ecstasy, which also is a Schedule I controlled substance.

To establish the pharmacological similarity element, the government presented the testimony of Dr. Cassandra Prioleau, a drug science specialist employed by the DEA, who qualified as an expert in the field of pharmacological effects of drugs. Dr. Prioleau testified that 4-MEC and MDPV each would have a pharmacological effect on the central nervous system substantially similar to the effect produced by methcathinone. Dr. Prioleau further testified that methylone would have a substantially similar pharmacological effect on the central nervous system as ecstasy.[4]

In his defense, McFadden presented the testimony of Dr. Matthew C. Lee, a primary care physician and pharmacist, who qualified as an expert in the field of pharmacology and the

[4] Dr. Prioleau acknowledged during cross-examination that methylone generally produced only about one-half the stimulant effect of ecstasy, but also noted that at a "maximum dosage" level methylone and ecstasy would have equivalent stimulant effects.

effects of medication. Dr. Lee criticized the methodology used by Dr. DiBerardino in reaching his conclusions regarding the chemical structure element, and further stated that MDPV and methcathinone are not similar in chemical structure.[5] Dr. Lee also criticized the methodology employed by Dr. Prioleau in reaching her conclusions with respect to the pharmacological similarity element. Dr. Lee testified that methylone did not produce similar pharmacological effects as ecstasy, and that there was insufficient scientific data to draw a conclusion that 4-MEC and MDPV produce similar pharmacological effects in humans as methcathinone.

After hearing this and other evidence, the jury returned a verdict finding McFadden guilty of each of the nine counts alleged in the indictment. At a sentencing hearing, the district court found that McFadden's advisory sentencing guidelines range was between 51 months' and 63 months' imprisonment. After considering the factors set forth in 18 U.S.C. § 3553(a), the court imposed a below-guidelines sentence of 33 months' imprisonment for each conviction, to run concurrently, and a 30-month period of supervised release. McFadden filed a timely notice of appeal.

[5] Dr. Lee did not make an explicit conclusion during his testimony about whether 4-MEC and methcathinone, or methylone and ecstasy, were substantially similar in their respective chemical structures.

III.

A.

We first consider McFadden's argument that the Act is unconstitutional as applied to him. This argument presents the central theme that the Act failed to provide a person of ordinary intelligence notice that the conduct at issue was unlawful.

McFadden argues that the Act fails to meet the constitutional requirement of notice because: (1) the Act uses a "standards-based" scheme, employing general terms such as "substantially similar" and "human consumption," and lacks a list of prohibited substances; (2) the Act is subject to arbitrary and discriminatory enforcement in the absence of statutory guidance concerning prohibited conduct; and (3) despite significant efforts on his part to learn about prohibited conduct, McFadden was unable to determine "what he can and cannot do," and was unaware that the distribution of controlled substance analogues is prohibited under federal law.

We review de novo a challenge to the constitutionality of a federal statute. United States v. Gibert, 677 F.3d 613, 618 (4th Cir. 2012). As a general matter, a criminal statute is unconstitutionally vague if it does not sufficiently define an offense such that ordinary people can understand what conduct is prohibited. Kolender v. Lawson, 461 U.S. 352, 357 (1983). This

inquiry generally requires an examination of what a person of "common intelligence" would reasonably understand the statute to prohibit, rather than what a particular defendant understood the statute to mean. See United States v. Washam, 312 F.3d 926, 930 (8th Cir. 2002) (citing United States v. Nat'l Dairy Prods., 372 U.S. 29, 32-33 (1963) and Connally v. Gen. Constr. Co., 269 U.S. 385, 391 (1926)). Additionally, a statute is unconstitutionally vague if its definition of the prohibited conduct encourages arbitrary and discriminatory enforcement. Kolender, 461 U.S. at 357-58.

In our decision in Klecker, we rejected a nearly identical constitutional challenge as that raised by McFadden. See 348 F.3d at 71-72. There, a defendant challenged his convictions for distributing a chemical compound commonly known as "Foxy." Id. at 71. The government alleged that Foxy was an analogue of a Schedule 1 controlled substance, diethyltryptamine (DET). Id. at 70. We held that the Act was not unconstitutionally vague in its use of the term "substantially similar" with respect to a defendant who lacked actual notice that a substance was a controlled substance analogue. Id. at 72. We observed that the considerable similarities, found from a comparison of chemical diagrams of the alleged analogue substance and the controlled substance, were sufficient to "put a reasonable person on notice" of Foxy's composition as a DET analogue. Id.

This holding in Klecker defeats McFadden's argument that the term "substantially similar," as used in 21 U.S.C. § 802(32)(A), is unconstitutionally vague when applied to the chemical compounds at issue here. The testimony of Dr. DiBerardino comprehensively addressed the chemical diagrams comparing the chemical structures of 4-MEC and MDPV with methcathinone, and methylone with ecstasy.

Presenting two-dimensional diagrams in which the chemical structures of 4-MEC and MDPV were displayed in an overlapping manner with the chemical structure of methcathinone, Dr. DiBerardino explained that these substances share a core chemical structure, namely that of a compound called phenethylamine. Although the overlapping diagrams showed that the substances each have some unique features in their respective chemical compositions, Dr. DiBerardino testified that these unique features do not affect the chemical core of the substances. Rather, he stated that the diagrams reflected that "[e]verything that's different is on the periphery" of the respective chemical structures. Dr. DiBerardino made the same type of comparison examining the chemical structures of methylone and ecstasy, during which he explained that those substances share the same core chemical structure, phenethylamine, and that the structural differences between methylone and ecstasy are insignificant.

Based on his evaluation of these diagrams of the chemical compounds at issue, Dr. DiBerardino concluded that the controlled substances and the respective alleged CSAs have substantially similar chemical structures. Thus, Dr. DiBerardino applied the statutory term "substantially similar" in evaluating the core chemical structures of the substances at issue, and was able to distinguish the differences in those structures as peripheral and inconsequential. After reviewing these chemical diagrams, we agree with the district court's conclusion that for purposes of satisfying the constitutional requirement of notice, there are substantial similarities in the chemical structures between the alleged CSAs and their controlled substance counterparts.

We also view the chemical diagrams and Dr. DiBerardino's testimony in light of the evidence concerning McFadden's intent that the alleged CSAs be consumed by humans to produce a stimulant effect. See Klecker, 348 F.3d at 72 (observing that defendant's intent that Foxy be ingested as a hallucinogen reinforced the conclusion that the defendant had adequate notice that Foxy would be regarded as a DET analogue). As stated above, McFadden informed McDaniel during recorded telephone conversations that the substances he was distributing produced

effects similar to certain controlled substances.[6] The fact that McFadden intended that the substances he was distributing be used as alternatives to controlled substances further demonstrates that a reasonable person in his position would understand that his conduct was prohibited by the Act. See id. In view of this evidence, the district court did not err in concluding that the statutory term "substantially similar," as applied here, would put a reasonable person on notice concerning the proscribed conduct.

We further disagree with McFadden's argument that the statutory term "human consumption" is unconstitutionally vague. See 21 U.S.C. § 813. Although McFadden notes correctly that this term is not defined in the Act, the lack of a statutory definition does not render the Act unconstitutional per se. See Chapman v. United States, 500 U.S. 453, 462, 467-68 (1991) (holding that 21 U.S.C. § 841(b)(1)(B) is not unconstitutionally vague despite lack of statutory definition of the terms "mixture" and "substance"). A statute need not contain a definition of every term within its text, and, in the absence of a statutory definition, courts will give terms their ordinary

[6] As discussed later in this opinion, we disagree with McFadden's argument that the district court erred in admitting the recorded telephone conversations into evidence. See infra at 20-21.

meaning. See United States v. Day, 700 F.3d 713, 725 (4th Cir. 2012) (citing Chapman, 500 U.S. at 462, 467-68).

We agree with the district court that, in the context of the Act, the ordinary meaning of the term "human consumption" plainly encompasses the use of a substance by a human being in a manner that introduces the substance into the body. See Black's Law Dictionary 359 (9th ed. 2009) (defining "consumption" as "the use of a thing in a way that exhausts it"). We therefore conclude that there is no ambiguity or vagueness in the Act's use of the term "human consumption."

Additionally, we reject McFadden's argument that the Act is unconstitutionally vague because it does not provide a list of substances that qualify as controlled substance analogues. Because the Act provides for the comparison of different chemical compounds to determine whether they are "substantially similar," a list of particular chemical compounds could not encapsulate the variety of substances potentially covered by the Act. Moreover, such a requirement would undermine the very purpose of the Act, which is to prevent individuals from creating slightly modified versions of controlled substances that produce similar effects and entail similar dangers as those controlled substances. See Klecker, 348 F.3d at 70; Hodge, 321 F.3d at 432, 437.

Given the creativity of individuals manufacturing these analogue substances, see United States v. Hofstatter, 8 F.3d 316, 322 (6th Cir. 1993), there is genuine potential that the creation of such substances could outpace any efforts by authorities to identify and catalog them. Thus, we decline to extend our holding in Klecker by imposing a constitutional notice requirement that the Act contain a list of prohibited substances. See United States v. Fisher, 289 F.3d 1329, 1337 n.11 (11th Cir. 2002) (rejecting vagueness challenge and noting that "[n]o list of controlled substance analogues is necessary").

We also find no merit in McFadden's argument that the Act is subject to arbitrary and discriminatory enforcement. We held in Klecker that the Act's "intent requirement alone tends to defeat any vagueness challenge based on the potential for arbitrary enforcement." 348 F.3d at 71. We explained that this intent element requires that the government prove that the defendant meant for the substance at issue to be consumed by humans. Id.; see also United States v. Roberts, 363 F.3d 118, 126 (2d Cir. 2004) (holding that the "intended for human consumption" element protects against arbitrary enforcement). Arbitrary and discriminatory enforcement further is prevented by the additional statutory requirements that the government prove (1) substantial chemical similarity between the alleged analogue

substance and the controlled substance, and (2) actual, intended, or claimed pharmacological similarity of the alleged analogue substance and the controlled substance. See Klecker, 348 F.3d at 71. Accordingly, we reject McFadden's arguments that the Act failed to provide him adequate notice of the prohibited conduct and was subject to arbitrary and discriminatory enforcement.

We likewise find no merit in McFadden's argument that the Act is unconstitutional as applied because he "took reasonable steps to inform himself as to the legality of the chemicals that he was selling," and did not find any information indicating that his actions were illegal. In support of this argument, McFadden relies on the fact that he visited the DEA's website to determine whether the substances at issue were prohibited, but that he did not see the disclaimers on the website discussing the Act and controlled substance analogues.

McFadden's argument fails because it flouts the well-settled general principle that "ignorance of the law is no excuse." See United States v. Mitchell, 209 F.3d 319, 323 (4th Cir. 2000) (citation omitted). Moreover, McFadden provides no authority supporting his novel proposition that we should depart from this general rule because he unsuccessfully sought to determine whether his conduct was lawful. Accordingly, we reject McFadden's argument that the Act is unconstitutional

because he lacked notice that the distribution of controlled substance analogues is prohibited under federal law.

B.

We next address McFadden's arguments concerning certain rulings made by the district court during the trial. McFadden contends that the district court erred: (1) in permitting the testimony of Toby Sykes, an individual who purchased bath salts from McDaniel; (2) in admitting into evidence recordings of McFadden's telephone conversations with McDaniel; and (3) in declining to instruct the jury that the government was required to prove that McFadden effectively knew that the substances at issue had the essential characteristics of controlled substance analogues.

1.

The government offered the testimony of Toby Sykes as evidence supporting the pharmacological similarity element. Sykes testified that he was a former methamphetamine addict who purchased bath salts from McDaniel, and that his use of these bath salts produced a far more potent effect on his body than his use of methamphetamine.[7]

[7] Although Sykes compared the bath salts to methamphetamine rather than methcathinone, Dr. Prioleau testified that various studies showed that MDPV and methylone produce a similar pharmacological effect in laboratory animals as the effect generated by methamphetamine. Accordingly, as the district (Continued)

McFadden objected to Sykes' testimony on the ground of relevance, because it was uncertain whether the bath salts that Sykes consumed had been supplied by McFadden or were in the same form and doses as those delivered to McDaniel. The district court overruled McFadden's objection, but granted him "great latitude" to cross-examine Sykes concerning whether he could state that the substances he purchased were distributed by McFadden.[8]

We review for abuse of discretion a district court's ruling concerning the admissibility of evidence. United States v. Summers, 666 F.3d 192, 197 (4th Cir. 2011). Under Rule 402 of the Federal Rules of Evidence, all "relevant" evidence is admissible unless specifically prohibited by the Constitution, a federal statute, or another evidentiary rule. Evidence is relevant if it has a tendency to make a fact pertinent to the case "more or less probable than [the fact] would be without the evidence." Fed R. Evid. 401; United States v. Powers, 59 F.3d 1460, 1465 (4th Cir. 1995). We have observed that the determination of relevance "presents a low barrier to

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court found, Sykes' comparison of the bath salts to methamphetamine was consistent with Dr. Prioleau's testimony.

[8] On appeal, McFadden bases his argument concerning Sykes' testimony on relevancy grounds, and does not argue that the testimony should have been struck under Federal Rule of Evidence 403 as having a probative value substantially outweighed by the danger of unfair prejudice.

admissibility," and that evidence need only be "worth consideration by the jury" to be admissible. United States v. Leftenant, 341 F.3d 338, 346 (4th Cir. 2003) (citation omitted). Accordingly, a district court has broad discretion in determining whether certain evidence is relevant. United States v. Queen, 132 F.3d 991, 998 (4th Cir. 1997).

Applying this deferential standard of review, we conclude that the district court did not abuse its discretion in admitting Sykes' testimony. As McFadden concedes, there was some overlap between the period in which Sykes purchased bath salts from McDaniel and the period in which McFadden supplied McDaniel with such substances. Also, importantly, Sykes' description of the packaging of the bath salts he purchased from McDaniel matched the description of the packaging used by McFadden in distributing the substances. Sykes was shown several exhibits of "blue baggies" containing substances that the government agents had purchased from McDaniel and, on at least one occasion, directly from McFadden. Sykes testified that he recognized the packaging of those exhibits because he had purchased bath salts from McDaniel in similar blue baggies.[9]

[9] McDaniel was also shown these exhibits during her testimony, during which she stated that she recognized those items as originating from McFadden because of their distinctive packaging.

Given this foundation evidence tending to show that some of the bath salts consumed by Sykes were supplied by McFadden, Sykes' testimony concerning the bath salts' effect on his body properly was submitted to the jury for purposes of establishing the pharmacological similarity element. Although there were flaws in Sykes' testimony relating to the time period at issue and whether McDaniel altered the substances after receiving them from McFadden, such flaws were explored during cross-examination and were relevant to the weight to be given Sykes' testimony, not to its admissibility. See Ziskie v. Mineta, 547 F.3d 220, 225 (4th Cir. 2008) (noting that determining the weight of evidence entails a different inquiry than the relevance inquiry required by Rules 401 and 402 of the Federal Rules of Evidence).

2.

We next consider McFadden's challenge to the admission of evidence of recorded telephone conversations between him and McDaniel. In the district court, McFadden objected to this evidence on the ground that the comparisons he made during these conversations were irrelevant to the crimes charged, because he claimed that 4-MEC produced effects similar to cocaine and methamphetamine, controlled substances not used for comparison under the chemical structure element. The district court overruled McFadden's objection, finding that this evidence was

relevant to both the pharmacological similarity element and the human consumption element.

On appeal, McFadden argues solely that the district court erred in concluding that the recordings were relevant to the pharmacological similarity element. McFadden does not address the district court's separate conclusion that this evidence was relevant to the human consumption element, nor does he raise an argument that admission of this evidence was unduly prejudicial under Rule 403. Because the human consumption element was an independent basis for the district court's admission of this evidence, we affirm the court's ruling on that basis and do not address McFadden's argument whether the recordings were relevant to proof of the pharmacological similarity element. See United States v. Hatchett, 245 F.3d 625, 644-45 (7th Cir. 2001) (holding defendant waived argument concerning district court's ruling on admissibility of evidence by failing to challenge on appeal one of two independent grounds for court's ruling).

3.

McFadden next asserts, on the basis of out-of-circuit precedent, that the district court erred in refusing to instruct the jury that the government was required to prove that he knew, had a strong suspicion, or deliberately avoided knowledge that the alleged CSAs possessed the characteristics of controlled substance analogues. See United States v. Turcotte, 405 F.3d

515, 527 (7th Cir. 2005). We review for abuse of discretion the district court's denial of the requested instruction. United States v. Bartko, 728 F.3d 327, 343 (4th Cir. 2013). To show an abuse of discretion, a defendant must establish that the proffered instruction: "(1) was correct, (2) was not substantially covered by the charge that the district court actually gave to the jury, and (3) involved some point so important that the failure to give the instruction seriously impaired the defendant's defense." Id.

McFadden's argument fails at the outset because he cannot satisfy the first requirement of this test. The instruction he proposed is not a correct statement of the law in this Circuit. In Klecker, we set forth the elements that the government was required to prove to obtain a conviction under the Act, including the scienter requirement that the defendant intended that the substance at issue be consumed by humans. 348 F.3d at 71. We further stated that the Act may be applied to a defendant who lacks actual notice that the substance at issue could be a controlled substance analogue. Id. at 72.

In contrast to our decision in Klecker, the Seventh Circuit has imposed a strict knowledge requirement before a defendant may be convicted of violating the Act. In its decision in Turcotte, the court stated that "our precedents demand a showing that the defendant knew the substance in question was a

controlled substance analogue." 405 F.3d at 527. Because we have not imposed such a knowledge requirement, and have not included the concepts of "strong suspicion" or "deliberate avoidance" in framing the scienter requirement under the Act, we hold that the district court properly denied McFadden's requested jury instruction.

C.

Finally, we address McFadden's argument challenging the sufficiency of the evidence and the district court's denial of his motion for judgment of acquittal. McFadden's sufficiency argument is limited to his contention that the government failed to satisfy its evidentiary burden of demonstrating that 4-MEC, MDPV, and methylone qualify as controlled substance analogues. McFadden does not otherwise contest the jury's verdict with respect to the conspiracy offense and the substantive counts of distributing controlled substance analogues in violation of the Act.

We review de novo the district court's denial of a motion for judgment of acquittal. United States v. Hamilton, 699 F.3d 356, 361 (4th Cir. 2012). In considering a defendant's argument that the evidence was insufficient to support his convictions, we will uphold a jury's verdict if, viewing the evidence in the light most favorable to the government, there is substantial evidence in the record to support the verdict. Id.

"Substantial evidence" is "evidence that a reasonable finder of fact could accept as adequate and sufficient to support a conclusion of a defendant's guilt beyond a reasonable doubt." United States v. Green, 599 F.3d 360, 367 (4th Cir. 2010).

In conducting this review, we afford the jury's verdict deference because "it is the jury's province to weigh the credibility of the witnesses, and to resolve any conflicts in the evidence." United States v. Dinkins, 691 F.3d 358, 387 (4th Cir. 2012) (citation omitted). Accordingly, a defendant challenging the sufficiency of the evidence on appeal bears a "heavy burden," and we will reverse a conviction for insufficient evidence "only in the rare case when the prosecution's failure is clear." Hamilton, 699 F.3d at 361-62 (citation and internal quotation marks omitted).

For ease of review, we restate the elements of the distribution offenses for which McFadden was convicted. In addition to proving that McFadden distributed the substances at issue, the government was required to prove that those substances: (1) have a substantially similar chemical structure as a Schedule I or II controlled substance; (2) have a substantially similar or greater pharmacological effect on the human central nervous system as a Schedule I or II controlled substance, which effect was either actual, intended, or represented by the defendant; and (3) were intended by the

defendant to be consumed by humans. See Klecker, 348 F.3d at 71.

As stated above, the government presented the testimony of Dr. DiBerardino, who concluded that 4-MEC and MDPV are substantially similar in chemical structure as methcathinone, a Schedule I controlled substance. The government also presented the testimony of Dr. Prioleau, who concluded that 4-MEC and MDPV produce a substantially similar pharmacological effect as methcathinone. McFadden asks us to cast aside Dr. DiBerardino and Dr. Prioleau's opinions and adopt the conflicting views of McFadden's expert witness, Dr. Lee. According to Dr. Lee, the scientific methods employed by Dr. DiBerardino and Dr. Prioleau were inadequate to reach their respective conclusions, with which Dr. Lee disagreed.

We recognized long ago that "[a]n appellate court is not the proper forum to refight a battle of expert witnesses." Connorton v. Harbor Towing Corp., 352 F.2d 517, 518 (4th Cir. 1965) (per curiam), quoted in United States v. Wood, 741 F.3d 417, 425 (4th Cir. 2013). That fight was waged in the district court in this case, and the jury chose to accept the conclusions of Dr. DiBerardino and Dr. Prioleau, despite defense counsel's vigorous cross-examination of those witnesses and the opposing testimony of Dr. Lee.

It would be improper under our standard of review to elevate Dr. Lee's opinion over the opinions of Dr. DiBerardino and Dr. Prioleau, because it is the jury's function to weigh witnesses' credibility, to determine the weight to be accorded their testimony, and to resolve conflicts in the evidence. Dinkins, 691 F.3d at 387; United States v. Maceo, 873 F.2d 1, 7 (4th Cir. 1989). Therefore, based on the record before us, we conclude that the government presented sufficient evidence that 4-MEC and MDPV are substantially similar in chemical structure as methcathinone, a Schedule 1 substance. We further conclude that the government presented sufficient evidence that 4-MEC and MDPV produce actual pharmacological effects on the central nervous system substantially similar to the effects produced by methcathinone.[10] In light of this conclusion concerning "actual" pharmacological similarity, we need not address McFadden's argument that there was insufficient proof that he "represented or intended" that 4-MEC and MDPV would have substantially similar pharmacological effects as a controlled substance.[11] See

[10] We note that because the jury's verdict is well-supported by Dr. DiBerardino and Dr. Prioleau's testimony, we need not consider Sykes' testimony in determining whether the government proved actual pharmacological similarity of these substances at issue.

[11] We therefore need not reach McFadden's arguments concerning his statements to McDaniel that 4-MEC and mixtures containing 4-MEC have an effect similar to substances other than (Continued)

Klecker, 348 F.3d at 71 (government may establish the pharmacological similarity element by showing "actual, intended, or claimed" similarity) (emphasis added).

Having reached this conclusion with respect to 4-MEC and MDPV, we need not address whether there was sufficient evidence in the record to conclude that methylone qualified as a controlled substance analogue. Each of the charges in the superseding indictment relating to methylone also alleged in the conjunctive that McFadden distributed MDPV or 4-MEC with respect to those counts. In other words, none of the charges hinged on a finding that methylone qualified as a controlled substance analogue.[12] Accordingly, even if we agreed with McFadden's arguments relating to methylone, we nevertheless would affirm each of his convictions. See Turner v. United States, 396 U.S. 398, 420 (1970) (reaffirming the general rule that if an indictment charges several acts in the conjunctive, a guilty verdict stands if the evidence is sufficient with respect to any one of the acts); United States v. Bollin, 264 F.3d 391, 412

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methcathinone, and do not decide whether the pharmacological similarity element may be established by comparing the alleged analogue substance to a different controlled substance than used for comparison under the chemical structure element.

[12] We further observe that because the government agreed to remove methylone from the calculation of drug weight for purposes of determining McFadden's advisory sentencing guidelines range, methylone was not a factor in the court's determination of McFadden's sentence.

n.14 (4th Cir. 2001) (in case involving perjury allegation charged in the conjunctive pertaining to two alleged false statements, holding that Court need not reach arguments pertaining to the first alleged false statement because evidence supported jury verdict relating to the second alleged false statement).

IV.

For these reasons, we affirm the district court's judgment.

AFFIRMED