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An Examination of Federal Sentencing Guidelines' Treatment of MDMA ("Ecstasy")

Alyssa Hennig
Independent Lawyer

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AN EXAMINATION OF FEDERAL SENTENCING GUIDELINES’ TREATMENT OF MDMA (“ECSTASY”)

ALYSSA C. HENNIG*

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* J.D., Summa Cum Laude, Belmont University College of Law (2014). A special note of thanks to Professor Jeffrey Usman for his advice throughout this writing process, and to the Belmont Law Review staff for all of their hard work.

INTRODUCTION

When it comes to issues with federal sentencing, the federal crack cocaine-to-powder cocaine sentencing disparity is one of the most notorious. The 100:1 crack cocaine-to-powder cocaine disparity took effect in 1987.¹ This meant that, “[f]or any given quantity of crack, the guideline range [was] the same as if the offense had involved 100 times that amount in powder cocaine.”² “[R]epresentatives of the Judiciary, criminal justice practitioners, academics, and community interest groups”³ have almost universally criticized the drug equivalency ratio, which has been called “one of the great stains on our federal criminal justice system.”⁴ The 100:1 ratio dramatically increased sentences for two distinct classes of individuals: African-Americans and those with low socioeconomic status.⁵ When Congress proposed the 100:1 ratio to the United States Sentencing Commission,⁶ it “had no hard evidence . . . to support the contention that crack [was] 100 times more potent or dangerous than powder cocaine.”⁷ Likewise, the Sentencing Commission also lacked sufficient evidence to support the 100:1 ratio that it recommended to Congress.⁸

By the mid-1990s, the Sentencing Commission recommended that the 100:1 ratio be abandoned, stating that it was unjustified.⁹ Congress, however, refused to act on the Commission’s repeated recommendations that the ratio be significantly lowered.¹⁰ Until President Barack Obama

1. See Anti-Drug Abuse Act of 1986, Pub. L. No. 99-570, § 1002, 100 Stat. 3207, 3207-2 to 3207-3 (1986) (codified as amended at 21 U.S.C. § 841 (2012)).

2. *United States v. Armstrong*, 517 U.S. 456, 478 (1996) (Stevens, J., dissenting).

3. U.S. SENT. COMM’N, REP. TO THE CONGRESS: COCAINE & FED. SENT. POLY. 2 (2007), available at http://www.ussc.gov/Legislative_and_Public_Affairs/Congressional_Testimony_and_Reports/Drug_Topics/200705_RtC_Cocaine_Sentencing_Policy.pdf.

4. Carol Cratty, *New Rules Slashing Crack Cocaine Sentences Go into Effect*, CNN (Nov. 2, 2011, 9:20 AM), <http://www.cnn.com/2011/11/01/justice/crack-cocaine-sentencing> (quoting the federal public defender for the Eastern District of Virginia).

5. See U.S. SENT. COMM’N, SPECIAL REP. TO CONGRESS: COCAINE AND FED. SENT. POLY. at v–viii (2002).

6. The United States Sentencing Commission is “an independent agency in the judicial branch of the government” that was established to create sentencing policies for the federal court system, advise Congress on issues of crime policy, and “collect, analyze, research, and distribute a broad array of information on federal crime and sentencing issues.” U.S. SENTENCING COMM’N., AN OVERVIEW OF THE U.S. SENT. COMM.’N 1 (2012), available at http://www.ussc.gov/About_the_Commission/Overview_of_the_USSC/USSC_Overview.pdf.

7. *United States v. Willis*, 967 F.2d 1220, 1226 (8th Cir. 1992) (Heaney, J., concurring).

8. See e.g., U.S. SENT. COMM’N, SPECIAL REP. TO CONGRESS: COCAINE AND FED. SENT. POLY. at 195–200 (1995).

9. *Id.*

10. Michael B. Cassidy, *Examining Crack Cocaine Sentencing in a Post-Kimbrough World*, 42 AKRON L. REV. 105, 114–16 (2009) (“On three separate occasions—in 1995, 1997 and 2002—the Commission issued a report asserting the following: (1) the 100-to-1 ratio was disproportionate to the harms associated with the two drugs; (2) courts could address the

signed the Fair Sentencing Act of 2010 into law,¹¹ federal courts disagreed about how to appropriately handle the unjustified 100:1 ratio, with some federal courts applying reduced 20:1¹² and 10:1¹³ ratios, while others maintained the 100:1 ratio.¹⁴ The 100:1 crack cocaine-to-powder cocaine drug equivalence ratio has received (and still receives) a vast amount of attention, and has been the subject of much academic analysis and discussion.¹⁵

On the other hand, the problem with the current methylenedioxymethamphetamine (“MDMA,” commonly referred to as “Ecstasy”)¹⁶ drug equivalency ratio is an emerging topic that has largely been ignored and under-analyzed.¹⁷ Although the two issues are, in some ways, distinguishable,¹⁸ both the current MDMA drug equivalency ratio and the former 100:1 crack cocaine-to-powder cocaine ratio are unjustified; they are both the products of an incomplete and improper analysis of scientific data and the relative social harms of trafficking and usage.¹⁹ The

harms associated with crack through specific non-drug-related enhancements; and (3) crack penalties fell disproportionately on lower-level participants, most often African-Americans.”).

11. See Fair Sentencing Act of 2010, Pub. L. No. 111-220, 124 Stat. 2372; Notice of a Temporary, Emergency Amendment to Sentencing Guidelines and Commentary, 75 Fed. Reg. 661, 88-02.

12. See, e.g., *United States v. Leroy*, 373 F.Supp. 2d 887 (E.D. Wisc. 2005).

13. See, e.g., *United States v. Fisher*, 451 F. Supp.2d 553, 562 (S.D.N.Y. 2005).

14. See, e.g., *United States v. Medina-Casteneda*, 511 F.3d 1246 (9th Cir. 2008).

15. See, e.g., Alyssa L. Beaver, *Getting a Fix on Cocaine Sentencing Policy: Reforming the Sentencing Scheme of the Anti-Drug Abuse Act of 1986*, 78 FORDHAM L. REV. 2531 (2010); Jesseca R.F. Grassley, *Fed. Cocaine Sentencing Policy Following the 1995 Cocaine Report: Issues of Fairness & Just Punishment*, 21 HAMLIN L. REV. 347 (1998); Randall Kennedy, *The State, Criminal Law, & Racial Discrimination: A Comment*, 107 HARV. L. REV. 1255 (1994); William Spade, Jr., *Beyond the 100:1 Ratio: Towards a Rational Cocaine Sentencing Policy*, 38 ARIZ. L. REV. 1233 (1996).

16. JULIE HOLLAND, ECSTASY: THE COMPLETE GUIDE: A COMPREHENSIVE LOOK AT THE RISKS AND BENEFITS OF MDMA 2 (2001).

17. See Jennifer Coffin, *Where Procedure Meets Substance: Making the Most of the Need for Adequate Explanation* (July 2010) (revised and updated through Dec. 2011), available at http://www.fd.org/docs/select-topics---sentencing/procedure_substance.pdf; Amanda Kay, *The Agony of Ecstasy: Reconsidering the Punitive Approach to U.S. Drug Policy*, 29 FORDHAM URB. L.J. 2133 (2002); Scott Michelman, & Jay Rorty, *Doing Kimbrough Justice: Implementing Policy Disagreements with the Fed. Sentencing Guidelines*, 45 SUFFOLK U. L. REV. 1083 (2012).

18. While the crack cocaine-to-powder cocaine disparity disproportionately impacted African-American defendants, the MDMA drug equivalency ratio has not been shown to have such an effect. Some also claim that the Commission’s consideration of empirical data and “national experience” regarding the harms of MDMA distinguish the MDMA drug equivalency ratio from the crack cocaine-to-powder cocaine ratio. E.g., *United States v. Kamper*, 860 F. Supp.2d 596, 607 (E.D. Tenn. 2012). The fact that the Commission’s decision about MDMA sentencing guidelines was based on a faulty and incomplete analysis of empirical data and of the drug’s social harms, however, makes the two issues more closely related than they may initially seem.

19. With regard to crack cocaine, the Commission’s false findings include: (1) that crack cocaine had identical physiological and psychoactive effects as powder cocaine;

Sentencing Commission failed to fulfill its proper institutional role when recommending both the MDMA and the crack cocaine ratios. As a result, defendants sentenced under the current MDMA Guidelines, just like defendants sentenced under the 1987 crack cocaine Guidelines, are receiving sentences that are “greater than necessary” to adequately protect the public, serve as an effective deterrent, and provide sufficient retribution.²⁰

History seems to be repeating itself. Despite the existence of data that showed that the 100:1 crack cocaine ratio was unjustified and unsupported by objective evidence, the 100:1 ratio remained in place for twenty-four years.²¹ As a result, federal courts began applying different ratios. Sentencing uniformity—from one judge to the next, from one courthouse to the next—began to suffer. Yet Congress could have prevented years of disproportionate and inconsistent sentencing in crack cocaine cases by simply amending the 100:1 ratio. Currently, the federal courts are again applying inconsistent drug equivalency ratios—but this time to cases involving MDMA.²² Sentencing uniformity is, once again, suffering.

This Note analyzes the MDMA drug equivalency ratio under the current Guidelines and argues that the ratio is based on incomplete and inaccurate information. Part I of this Note provides an overview of the United States Sentencing Commission (“the Commission”) and the United States Sentencing Guidelines (“the Guidelines”). Part II discusses the rise of MDMA and the legislative response. It also summarizes the Commission’s findings regarding the social and physiological harms of MDMA that formed the basis for the Commission’s decision about the appropriate MDMA drug equivalency ratio. Part III examines the errors in the Commission’s empirical analysis of the harms of MDMA, and in its comparison of the social harms of MDMA to the social harms of other drugs. It also reviews the currently-unresolved federal district court split

(2) that crack cocaine use was going to become an epidemic among the nation’s youth; and (3) the high level of violence associated with trafficking. See Tyler B. Parks, *The Unfairness of the Fair Sentencing Act of 2010*, 42 U. MEM. L. REV. 1105, 1114 (2012) (citing U.S. SENT. COMM’N, REP. TO THE CONGRESS: COCAINE & FED. SENT. POLY. E-5 (2002)). Part III of this Note will explore the ways in which the Commission’s findings with regard to MDMA were inaccurate.

20. See 18 U.S.C. § 3553(a) (2012) (enumerating the purposes to be served by sentencing).

21. The 100:1 ratio took effect in 1986 and remained unchanged until President Obama signed the Fair Sentencing Act of 2010, which ultimately resulted in an 18:1 ratio. See Anti-Drug Abuse Act of 1986, Pub. L. No. 99-570, § 1002, 100 Stat. 3207, 3207-2 to 3207-3 (1986) (codified as amended at 21 U.S.C. § 841 (2012)); Fair Sentencing Act of 2010, Pub. L. No. 111-220, 124 Stat. 2372; Notice of a Temporary, Emergency Amendment to Sentencing Guidelines and Commentary, 75 Fed. Reg. 661, 88-02.

22. See, e.g., *United States v. Kamper*, 860 F. Supp. 2d 596, 609 (E.D. Tenn. 2012) (applying the standard 1:500 ratio); *United States v. McCarthy*, No. 09-CR-1136, 2011 WL 1991146 (S.D.N.Y. May 19, 2011) (applying a 1:200 ratio).

over whether to defer to the MDMA drug equivalency ratio set forth in the Guidelines. Finally, Part IV calls for a prompt reevaluation of the current MDMA-to-marijuana drug equivalency ratio. This Note concludes that a reevaluation of the MDMA drug equivalency ratio is necessary to ensure horizontal sentencing uniformity, to prevent inefficient use of judicial resources, and to ensure that defendants' sentences are sufficient but not greater than necessary, as required by 18 U.S.C. § 3553(a)(2).

I. BACKGROUND

A. The United States Sentencing Guidelines

The United States Sentencing Guidelines are the product of Congress's attempt to ensure uniformity in sentences across the country by implementing nationalized rules for federal criminal sentencing. This section provides an overview of the Commission and of the Guidelines that the Commission promulgated. First, this section discusses the reasons why Congress created the Commission. This section then explores the ways in which case law has modified the Guidelines and ends with a general discussion about the ways in which federal courts currently apply the Guidelines.

1. The Commission

In 1984, Congress gave the United States Sentencing Commission the authority to promulgate the United States Sentencing Guidelines through the Sentencing Reform Act.²³ The Commission consists of seven voting members, at least three of whom must be federal judges.²⁴ Prior to the enactment of the Sentencing Reform Act of 1984, “[s]tatutes specified the penalties for crimes but nearly always gave the sentencing judge wide discretion to decide whether the offender should be incarcerated and for how long.”²⁵ Congress was unsatisfied with the broad discretion afforded to judges, however. This dissatisfaction largely stemmed from Congress's concern that similarly situated defendants who were convicted of similar crimes were receiving substantially different sentences.²⁶ Under the pre-1984 indeterminate sentencing regime, the length of a defendant's sentence could largely depend upon the sentencing judge, the courthouse or

23. See 28 U.S.C. §§ 991–998 (2012); *see also* 18 U.S.C. §§ 3551–86, 3601–742 (2012); Sentencing Reform Act of 1984, Pub. L. No. 98-473, 98 Stat. 1987 (1984).

24. 28 U.S.C. § 991(a).

25. *Mistretta v. United States*, 488 U.S. 361, 363 (1989).

26. *Blakely v. Washington*, 542 U.S. 296, 315 (2004) (O'Connor, J., dissenting).

geographic region in which the defendant was convicted, and even the defendant's race,²⁷ gender,²⁸ or social class.²⁹

Through the creation of the Commission, Congress aimed to achieve two main goals: (1) “*uniformity* in sentencing by narrowing the wide disparity in sentencing imposed by different federal courts for similar criminal conduct”³⁰ and (2) “*proportionality* in sentencing through a system that imposes appropriately different sentences for criminal conduct of differing severity.”³¹ In order to achieve both uniformity and proportionality in sentencing, the Commission's responsibilities are:

- (1) to establish sentencing policies and practices for the federal courts, including guidelines to be consulted regarding the appropriate form and severity of punishment for offenders convicted of federal crimes;
- (2) to advise and assist Congress and the executive branch in the development of effective and efficient crime policy; and
- (3) to collect, analyze, research, and distribute a broad array of information on federal crime and sentencing issues, serving as an information resource for Congress, the executive branch, the courts, criminal justice practitioners, the academic community, and the public.³²

In order to achieve proportionality in sentencing, the Commission is specifically tasked with ensuring that federal sentencing “policies and practices” fulfill the purposes set forth in 18 U.S.C. § 3553(a)(2). Section 3553(a)(2) requires that a defendant's sentence be “sufficient, *but not greater than necessary*”:

27. *Id.* at 316 (Justice O'Connor stating, “Indeed, rather than reflect legally relevant criteria these disparities too often were correlated with constitutionally suspect variables such as race.”).

28. ARTHUR W. CAMPBELL, *LAW OF SENTENCING*, § 1:3, at 9–10 (2d ed. 1991).

29. Robert J. Anello & Jodi Misher Peikin, *Evolving Roles in Fed. Sentencing: The Post-Booker/Fanfan World*, 1 *FED. CTS. L. REV.* 301, 303 (2006).

30. U.S. SENTENCING GUIDELINES MANUAL § 1A1.1(3) (2012) (emphasis added). This specifically means that the sentencing guidelines should not result in “unwarranted sentencing disparities among defendants with similar records” who are convicted of similar crimes. 28 U.S.C. § 991(b)(1)(B) (2012); 28 U.S.C. § 3553(a)(6).

31. U.S. SENTENCING GUIDELINES MANUAL § 1A1.1(3) (2012) (emphasis added).

32. U.S. SENT. COMM'N, AN OVERVIEW OF THE U.S. SENT. COMM'N 1 (2011), available at http://www.ussc.gov/About_the_Commission/Overview_of_the_USSC/USSC_Overview.pdf [hereinafter OVERVIEW] (“The Commission is charged with the ongoing responsibilities of evaluating the effects of the sentencing guidelines on the criminal justice system, recommending to Congress appropriate modifications of substantive criminal law and sentencing procedures, and establishing a research and development program on sentencing issues.”).

(A) to reflect the seriousness of the offense, to promote respect for the law, and to provide just punishment for the offense;

(B) to afford adequate deterrence to criminal conduct;

(C) to protect the public from further crimes of the defendant; and

(D) to provide the defendant with needed educational or vocational training, medical care, or other correctional treatment in the most effective manner.³³

In an effort to ensure proportionality in sentencing, the Guidelines also require sentencing judges to consider “the nature and circumstances of the offense and the history and characteristics of the defendant.”³⁴

The desire to eliminate subjective sentencing decisions led Congress to create a Commission that could promulgate Guidelines based on objective criteria. Objective assessments about the harms caused by different crimes and the effectiveness of sentences necessarily include an analysis of empirical data. Scientific data is a necessary component of an accurate assessment of the effectiveness of current sentencing regimes. Scientific data also provides an objective way to measure the harm inflicted by certain offenses.³⁵ Because scientific data is such a critical component of proportionate sentencing, an entire department of the Commission is dedicated to collecting and analyzing research and data.³⁶ The Commission’s “characteristic institutional role” requires the Commission to thoroughly analyze scientific data and to base the Guidelines on that analysis.³⁷ The Commission is better situated than courts to formulate and refine sentencing guidelines precisely because of its unique ability to “base its determinations on empirical data and national experience,” combined with its “guid[ance] by a professional staff with appropriate expertise.”³⁸

33. 18 U.S.C. §§ 3553(a)(2)(A)–(D) (2012) (emphasis added); *see also* 28 U.S.C. § 991(b)(1)(A).

34. 18 U.S.C. § 3553(a)(1).

35. Science alone may not be able to fully and accurately measure the harms caused by specific offenses, but science provides an objective baseline from which to start. Less measureable harms, such as social harms, can then be added to this baseline. Without an objective form of measurement, however, the entire system would be subjective (and arguably arbitrary). For an in-depth discussion on the relationship between empirical data and sentencing, see Steven L. Chanenson, *Sentencing & Data: The Not-So-Odd Couple*, 16 *FED. SENT. R.* 1 (2003).

36. *OVERVIEW*, *supra* note 32, at 3.

37. *Kimbrough v. United States*, 552 U.S. 85, 109 (2007).

38. *Id.* (citations omitted).

2. The Guidelines and Their Evolution

The Guidelines, as set forth by the Commission, went into effect in 1987.³⁹ The Guidelines provide a sentencing range⁴⁰ based on the defendant's "base offense level," which is determined by the defendant's alleged conduct⁴¹ and prior criminal history.⁴² More serious crimes are generally represented by higher base offense levels.⁴³ Likewise, the more extensive a defendant's prior criminal history, the longer the recommended sentence.⁴⁴ When determining the defendant's sentence, the judge also considers factors unique to the individual defendant which are set forth in the defendant's Presentence Investigation Report.⁴⁵

The Commission designed the Guidelines' base offense levels to reflect the seriousness of the defendant's crime. For drug-related convictions, however, the defendant's base offense depends on both the type and quantity of the drug involved.⁴⁶ The Guidelines contain a Drug Equivalency Table, which is essentially a conversion table that allows judges to convert the quantity of any type of drug into "its equivalent quantity of mari[j]uana."⁴⁷ This means that, under the Guidelines, "marijuana penalties are used as a common standard to which all other drugs are related mathematically."⁴⁸

39. U.S. SENT. COMM'N, U.S. SENT. COMM'N GUIDELINES MANUAL 1 (2003), available at http://www.ussc.gov/Guidelines/2003_guidelines/Manual/2003guid.pdf.

40. A sentencing range is a range of time for which the defendant must be sentenced to prison.

41. The appropriate base offense level corresponds with the defendant's conviction. U.S. SENTENCING GUIDELINES MANUAL § 1B1.1(a)(1) (2012). "[S]pecific offense characteristics," if applicable to the defendant's crime, are added to the base offense level. *Id.* § 1B1.1(a)(2). This level is further adjusted based on facts pertaining to the defendant's role in the crime, the harm to or classification of the victim, defendant's obstruction of justice, and the defendant's "acceptance of responsibility." *Id.* §§ 1B1.1(a)(3)–(5).

42. U.S. SENTENCING GUIDELINES MANUAL §§ 1B1.1(a)(6)–(7); see also *id.* § 4B1.1 (2012) (referring to "career offender" status); U.S. SENT. COMM'N, 2010 GUIDELINES SENT. TABLE, available at http://www.ussc.gov/Guidelines/2010_guidelines/Manual_PDF/Sentencing_Table.pdf [hereinafter 2010 GUIDELINES TABLE].

43. 2010 GUIDELINES TABLE, *supra* note 42, at 1.

44. *Id.*

45. The presentence investigation report is mandatory pursuant to 18 U.S.C. § 3552(a) (2012) and FED. R. CRIM. P. 32(c)–(d). The presentence investigation report is compiled by a probation officer and contains information about the defendant such as her criminal history and financial condition. It also contains information about "any circumstances affecting [her] behavior that may be helpful in imposing sentencing," and an "assessment of the financial, social, psychological, and medical impact on, and cost to, any individual against whom the offense was committed." Francis M Dougherty, *Sufficiency of Federal Trial Court's Compliance with Requirements of Federal Rules of Criminal Procedure 32(a)(1)(A) and 32(c)(3)(D)*, 101 A.L.R. FED. 308 § 2 (1991).

46. See U.S. SENTENCING GUIDELINES MANUAL § 2D1.1(c) (2012).

47. U.S. SENTENCING GUIDELINES MANUAL § 2D1.1, nn.10(A), (D).

48. U.S. SENT. COMM'N, REP. TO THE CONGRESS: MDMA DRUG OFFENSES EXPLANATION OF RECENT GUIDELINE AMENDMENTS 5, n.1 (2001) [hereinafter GUIDELINE

The Guidelines were initially mandatory, which meant that federal sentencing judges were required to “impose a sentence within the applicable Guidelines range.”⁴⁹ Sentencing judges could not impose a sentence above or below the Guidelines range unless the judge found “an aggravating or mitigating circumstance of a kind, or to a degree, not adequately taken into consideration by the Sentencing Commission.”⁵⁰ A defendant’s individual characteristics and circumstances, such as age, education, health, and disadvantaged upbringing, were not a part of formulating an appropriate sentence.⁵¹

Although federal judges were initially required to follow the Guidelines, the Guidelines became advisory in 2005. As foreshadowed in *Blakely v. Washington*,⁵² the Supreme Court, in *United States v. Booker*, held that the application of the federal Guidelines violated the Sixth Amendment right to trial by jury.⁵³ The violation occurred because the sentencing judge increased the defendant’s sentencing range based on his finding of facts by a mere preponderance of the evidence.⁵⁴ Because the Guidelines, as being applied, were in violation of the Sixth Amendment, the *Booker* Court stated that the Guidelines would be merely advisory.⁵⁵ Acknowledging the importance of horizontal sentencing uniformity, however, the *Booker* Court left the Guidelines themselves intact.⁵⁶ The Court emphasized its desire to preserve Congress’s intent “to provide certainty and fairness in meeting the purposes of sentencing, while avoiding

AMENDMENTS]. For example, the five-year penalty for marijuana begins at 100,000 grams. The corresponding five-year penalty for powder cocaine is 500 grams. The ‘marijuana equivalency’ for powder cocaine is: one gram of powder cocaine equals 200 grams of marijuana. In the powder cocaine example, the 500 grams is multiplied by 200 for a result of 100,000 grams (identical to the five-year marijuana quantity). This value (100,000 grams) can then be used to establish the penalty found in the “Drug Quantity Table,” located in U.S. SENTENCING GUIDELINES MANUAL § 2D1.1.

49. *United States v. Booker*, 543 U.S. 220, 259 (2005) (citing 18 U.S.C. § 3553(b)(1)).

50. 18 U.S.C. § 3553(b)(1) (2012). The only other circumstance in which an out-of-range sentence was permitted was when a defendant provided substantial assistance to the prosecution. *See* 18 U.S.C. § 3553(e).

51. Ricardo J. Bascuas, *The American Inquisition: Sentencing After the Fed. Guidelines*, 45 WAKE FOREST L. REV. 1, 13 (2010) (citing U.S. SENT. COMM’N, U.S. SENT. GUIDELINES MANUAL 449 (2009)).

52. 542 U.S. 296 (2004). In *Blakely*, the Supreme Court held that Washington’s sentencing Guidelines violated the Sixth Amendment right to trial by jury because the Guidelines permitted judges to increase a defendant’s sentence beyond the Guidelines’ range if the judge found “substantial and compelling reasons” to do so. *Id.* at 299, 305. This holding was largely based on a rule previously set forth in *Apprendi v. New Jersey*, which mandated that, “[o]ther 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, and proved beyond a reasonable doubt.” 530 U.S. at 466, 490 (2000); *see also Blakely*, 542 U.S. at 301.

53. *Booker*, 543 U.S. at 226.

54. *Id.*

55. *Id.* at 264.

56. *Id.*

unwarranted sentencing disparities and maintaining sufficient flexibility to permit individualized sentences when warranted.”⁵⁷ The Court mandated that district court judges “consult [the] Guidelines and take them into account when sentencing.”⁵⁸

Shortly after *Booker*, the Supreme Court held in *Rita v. United States* that appellate courts could “apply a presumption of reasonableness to a district court sentence that reflects a proper application of the Sentencing Guidelines.”⁵⁹ The *Rita* Court specifically stated that “it is fair to assume that the Guidelines, insofar as practicable, reflect a rough approximation of sentences that might achieve the objectives of § 3553(a).”⁶⁰ In *Gall v. United States*, the Supreme Court further clarified that the appellate courts must review for an abuse of discretion, regardless of whether the district court judge followed the Guidelines’ suggested sentencing range.⁶¹ According to *Rita*, the appellate court should first ensure that the lower court did not make any significant procedural errors.⁶² The appellate court should next consider whether the sentence was substantively reasonable under the totality of the circumstances, using an abuse of discretion standard of review.⁶³

Under the advisory Guidelines, judges may deviate from the Guidelines and their decisions are reviewed only for an abuse of discretion.⁶⁴ In *Kimbrough v. United States*, a federal district court judge who presided over a case involving crack cocaine ordered a sentence that was substantially lower than the Guidelines sentencing range because the judge thought that the suggested range was greater than necessary to serve the objectives of § 3553(a).⁶⁵ At the time, there was a 100:1 powder cocaine-to-crack cocaine drug equivalency ratio.⁶⁶ The district court judge’s downward departure was not based on factors particular to the defendant, but, rather, was based on a policy disagreement with the 100:1 ratio.⁶⁷

57. *Id.* (quoting 28 U.S.C. § 991(b)(1)(B)) (internal quotation and editorial marks omitted). *Booker* also required the federal circuit courts to review sentencing appeals for “unreasonableness.”

58. *Id.* (“The district courts, while not bound to apply the Guidelines, must consult those Guidelines and take them into account when sentencing.”).

59. 551 U.S. 338, 347 (2007). *Rita* also states that a sentencing judge should provide a statement of his or her reasons for imposing a sentence. *Id.* at 356. The length and detail required depends on the circumstances of the case; the judge “should set forth enough to satisfy the appellate court that he has considered the parties’ arguments and has a reasoned basis for exercising his own legal decision-making authority.” *Id.*

60. *Id.* at 350.

61. 552 U.S. 38, 51 (2007).

62. *Id.*

63. *Id.*

64. *See* *Kimrough v. United States*, 552 U.S. 85 (2007).

65. *Id.* at 92–93.

66. *Id.* at 94.

67. *Id.* at 93.

The Supreme Court, emphasizing the advisory nature of the Guidelines after *Booker*, held that the district court judge's decision to deviate from the Guidelines for policy reasons was not an abuse of discretion.⁶⁸ Two years later, in *Spears v. United States*, the Supreme Court further emphasized that *Kimbrough* was "a recognition of district courts' authority to vary from the crack cocaine Guidelines based on *policy* disagreement with them, and not simply based on an individualized determination that they yield an excessive sentence in a particular case."⁶⁹

As it stands today, a sentencing judge may impose a sentence outside of the Guidelines for substantive or policy reasons as long as she adequately considers the factors set forth in § 3553(a) and briefly explains her reasoning.⁷⁰ Judges can (and do) deviate from Sentencing Guidelines ranges for substantive reasons, such as a defendant's mental health or disadvantaged upbringing, and, sometimes, for policy reasons, such as a disagreement with the Guidelines.⁷¹ Data suggests, however, that the majority of judges do not significantly stray from the suggested Guidelines range; since the Guidelines became advisory in 2005, the average federal criminal sentence has remained virtually the same length.⁷² Data from 2008

68. *Id.* at 111. The Court noted that the current Guidelines as they pertained to crack cocaine did not "exemplify the Commission's exercise of its characteristic institutional role," adding that the Commission "did not take account of empirical data and national experience." *Id.* at 109–10 (internal citations omitted) (noting also that "the Commission itself has reported that the crack/powder disparity produces disproportionately harsh sanctions").

69. 555 U.S. 261, 264 (2009). *Spears* also clarified "that district courts are entitled to reject and vary categorically from the crack-cocaine Guidelines based on a policy disagreement with those Guidelines." *Id.* at 265–66.

70. Greater deviations from the Guidelines likely require a more thorough explanation for the deviation. *Gall v. United States*, 552 U.S. 38, 47 (2007).

71. *See, e.g., id.*; *Mistretta v. United States*, 488 U.S. 361 (1989).

72. The average sentence length for federal criminal offenders: 2005=46.3 months; 2006=51.8 months; 2007 = 51.8 months; 2008=49.6 months; 2009=46.8 months; 2010=44.3 months; 2011=43 months; 2012=44 months. *See* U.S. SENT. COMM'N, 2005 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2005), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2005/table13_pre.pdf; U.S. SENT. COMM'N, 2006 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2006), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2006/table13.pdf; U.S. SENT. COMM'N, 2007 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2007), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2007/Table13.pdf; U.S. SENT. COMM'N, 2008 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2008), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2008/Table13.pdf; U.S. SENT. COMM'N, 2009 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2009), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2009/Table13.pdf; U.S. SENT. COMM'N, 2010 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2010), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2010/Table13.pdf; U.S. SENT. COMM'N, 2011 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2011), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2011/Table13.pdf; U.S. SENT. COMM'N, 2012 SOURCEBOOK OF FED. SENT. STATS. 1, tbl. 13 (2012), *available at* http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2012/sbtoc12.htm.

through 2012 about the length of federally imposed sentences relative to the length suggested by the Guidelines reveals that most judges have continued to adhere to the Guidelines: throughout this five year period, there has only been a 7% increase in sentences that fall outside of the Guidelines range,⁷³ and there has only been a 4.4% increase in non-government sponsored sentences⁷⁴ that fall below the Guidelines range.⁷⁵ The largest increase—a 10.2% increase—in sentences that fall outside of the Guidelines range occurred between post-*Blakely* 2004 and post-*Booker* 2005.⁷⁶

The fact that *Booker* has not made a significant impact on the length of the majority of federal criminal sentences likely has several causes. The presumption of reasonableness set forth in *Rita* encourages judges to impose within-guidelines sentences because within-guidelines sentences are much more likely to be upheld.⁷⁷ Additionally, the Guidelines remain the starting point for determining a federal sentence, which means that absent exceptional circumstances, judges typically will impose a within-Guidelines sentence.⁷⁸

II. THE RISE OF MDMA AND THE LEGISLATIVE RESPONSE

MDMA has existed for over one hundred years,⁷⁹ but it was not classified as an illegal substance in the United States until 1985,⁸⁰ and the drastic increase in penalties for MDMA-related offenses did not occur until 2000.⁸¹ This section discusses the history of MDMA and its usage in

73. Sentences within the Guideline range: 2008=59.4%; 2009=56.8%; 2010=55%; 2011=54.5%; 2012=52.4%. U.S. SENT. COMM'N, 2012 SOURCEBOOK OF FED. SENT. STATS. 1, fig. G (2012), available at http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2012/FigureG.pdf. [hereinafter 2012 SOURCEBOOK fig. G].

74. “Non-government sponsored” means that the below-Guidelines sentence was not due to the defendant’s substantial assistance to the prosecutor (§ 5K1.1) or because Early Disposition Programs (§ 5K3.1)/ the prosecutor recommended the downward departure. See U.S. SENTENCING GUIDELINES MANUAL §§ 5K1.1, 5K3.1 (2012).

75. Non-Government Sponsored Below Range Sentences: 2008=13.4%; 2009=16%; 2010=17.8%; 2011=17.4%; 2012=17.8%. 2012 SOURCEBOOK fig. G, *supra* note 73 at 1.

76. U.S. SENT. COMM'N, 2005 SOURCEBOOK OF FED. SENT. STATS. 1, fig. G (2005), available at http://www.ussc.gov/Data_and_Statistics/Annual_Reports_and_Sourcebooks/2005/fig-g-post.pdf (within-Guideline sentences comprise 69.4% of all sentences in 2003, 72.2% of cases in Pre-*Blakely* 2004, 71.8% of cases in Post-*Blakely* 2004, and 70.9% of cases in Post-*Booker* 2005).

77. See *Rita v. United States*, 551 U.S. 338, 354–55 (2007); Mark Osler, *The Promise of Trailing-Edge Sentencing Guidelines to Resolve the Conflict Between Uniformity & Judicial Discretion*, 14 N.C. J.L. & TECH. 203, 210 (2012).

78. *Pepper v. United States*, 131 S. Ct. 1229, 1233 (2011).

79. HOLLAND, *supra* note 16, at 1.

80. Kelly M. Smith et. al., *Club Drugs: Methylenedioxyamphetamines, Flunitrazepam, Ketamine Hydrochloride, and Y-Hydroxybutyrate*, 59 AM. J. HEALTH – SYSTEM PHARMACY 1067, 1070 (2002).

81. Children’s Health Act of 2000, Pub.L. No. 106-310, §§ 3661–65, (codified at 42 U.S.C. §§ 290aa-5b); U.S. SENT. COMM'N, REPORT TO THE CONGRESS: MDMA DRUG OFFENSE, EXPLANATION OF RECENT GUIDELINE AMENDMENTS 2 (2001).

America. This section then discusses the Ecstasy Anti-Proliferation Act of 2000, which directed the Commission to research the harms of MDMA and recommend an appropriate drug equivalency ratio. After detailing the Commission's findings with regard to both social and physiological harms, this section concludes with a discussion of the Commission's decision to dramatically increase the drug equivalency ratio for MDMA.

A. The Rise of MDMA

MDMA was synthetically created in Germany sometime before 1912.⁸² MDMA "significantly increase[s] feelings of anxiety, confusion, vigor, friendliness, elation, positive mood and arousal."⁸³ Beginning in the 1970s, American psychologists and therapists used MDMA in psychotherapy sessions as a way to generate empathy and enhance communication and self-introspection.⁸⁴ In 1985, the Drug Enforcement Administration ("DEA") reclassified MDMA as a Schedule I controlled substance.⁸⁵ The DEA justified this reclassification by emphasizing its concerns about MDMA's potential neurotoxicity.⁸⁶

MDMA quickly gained popularity in the late 1980s, following extensive media coverage of the Congressional hearings regarding the rescheduling of MDMA.⁸⁷ MDMA became prevalent on college campuses and was the drug of choice for many young Americans in the rave scene.⁸⁸

82. HOLLAND, *supra* note 16, at 1.

83. Janelle Van Wel et al., *Effects of Acute MDMA Intoxication on Mood & Impulsivity: Role of the 5-HT₁ Receptors*, 7 PLOS ONE (2012), available at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0040187#pone.0040187-Curran1>.

84. HOLLAND, *supra* note 16, at 3.

85. Smith, *supra* note 80, at 1070.

86. Steven B. Karch, *A Historical Review of MDMA*, 4 OPEN FORENSIC SCI. J. 20, 22 (2011), available at http://www.researchgate.net/publication/22847460_A_historical_review_of_MDMA/file/d912f50b02aeb3eee8.pdf. Neurotoxicity "is the ability to damage or destroy neurons (nerve cells) in the brain and/or other parts of the nervous system." JACQUELINE L. LONGE, 2 GALE ENCYCLOPEDIA OF CANCER 1032 (3d ed. 2010).

87. Karch, *supra* note 86, at 21 ("The Congressional hearings on MDMA received an inordinate amount of media attention. The results might have been expected: demand for illicit MDMA exploded and soon it was for sale on college campuses across the United States . . ."); see also Charles S. Grob, *Deconstructing Ecstasy: The Politics of MDMA Research*, 8 ADDICTION RES. 6, 553 (2000), available at http://www.maps.org/w3pb/new/2000/2000_grob_1139_1.pdf.

88. Karch, *supra* note 86, at 21. Raves are "underground events" that typically feature electronic/techno music and all-night dance parties, often taking place in venues such as "warehouse[s], open field[s], or empty building[s]." Erin Treacy, *The Rave Act: A Specious Solution to the Serious Problem of Increased Ecstasy Distribution: Is It Unconstitutionally Overbroad?*, 28 HASTINGS COMM. & ENT. L.J. 229, 234 (2006); see also HOLLAND, *supra* note 16, at 1. A common dictionary definition is, "a large overnight dance party featuring techno music and usually involving the taking of mind-altering drugs." *Rave*, MERRIAM-WEBSTER DICTIONARY, <http://www.merriam-webster.com/dictionary/rave?show=0&t=1392251102> (last visited Feb. 21, 2014).

Its popularity in the rave scene created concern among legislators, because many of the people who attended these raves and used MDMA were under the age of twenty five.⁸⁹ MDMA continued to gain popularity throughout the 1990s, and, by the summer of 2000, the DEA estimated that 2,000,000 MDMA tablets⁹⁰ were being imported into America every week.⁹¹ MDMA primarily affects the brain's levels of serotonin⁹² and dopamine.⁹³ Specifically, MDMA blocks the brain's reuptake of serotonin, while inducing the brain to release both serotonin and dopamine.⁹⁴ Common street names for MDMA include "Molly,"⁹⁵ "Adam," "rolls," "beans," "Ecstasy,"⁹⁶ "E," "XTC," and "X."⁹⁷

B. The Congressional Response: The Ecstasy Anti-Proliferation Act of 2000

In response to the quickly-growing popularity of MDMA, Congress passed the Ecstasy Anti-Proliferation Act of 2000, which recommended that the United States Sentencing Commission increase penalties for MDMA-

89. Karch, *supra* note 86, at 21. MDMA use at raves, "where ambient temperatures may be high," also posed further complications because users would "danc[e] for many hours without adequate fluid replacement." HOLLAND, *supra* note 16, at 2. This increased the rates of hyperthermia among MDMA users, which led to some users collapsing or convulsing at raves. Some scientists believe, however, that these risks were due less to MDMA itself and more to "the circumstances in which [MDMA] is misused." *Id.* The fact that patients who used MDMA during supervised psychotherapy sessions did not experience hyperthermia also supports this conclusion.

90. MDMA tablets typically contain about 50–150 milligrams of MDMA. DRUG ENFORCEMENT ADMIN., DRUGS OF ABUSE 60 (2011), available at http://www.justice.gov/dea/pr/multimedia-library/publications/drug_of_abuse.pdf. The tablets themselves typically weigh 250–300 milligrams. GUIDELINE AMENDMENTS, *supra* note 48, at 16. The street value of an MDMA tablet in 2000 averaged twenty-six dollars in Tennessee. NAT'L DRUG INTEL. CTR., TENNESSEE DRUG ASSESSMENT (May 2002), <http://www.justice.gov/archive/ndic/pubs1/1017/odd.htm>.

91. HOLLAND, *supra* note 16, at 18–19.

92. "Serotonin has different inhibitory roles in several parts of the brain, and serotonin concentrations have been reported to modify mood, appetite, memory, and learning ability." LARRY L. MAI, THE CAMBRIDGE DICTIONARY OF HUMAN BIOLOGY & EVOLUTION 481 (2005).

93. *Id.* at 153 ("Dopamine is a key neurotransmitter and basal ganglia inhibitor, and is involved in several left-hemisphere skills critical to language and thought. Dopamine also plays a role in counteracting hyperthermia during endurance activity . . ."); HOLLAND, *supra* note 16, at 18–19.

94. *Id.*

95. Sara Bellum, *Meet Molly: The Truth About MDMA*, NAT'L DRUG INST. ON DRUG ABUSE (May 1, 2012), <http://teens.drugabuse.gov/blog/post/meet-molly-truth-about-ecstasy>.

96. Christina L. Sein, *The Agony & the Ecstasy: Preserving First Amendment Freedoms in the Government's War on Raves*, 12 S. CAL. INTERDISC. L.J. 139, 165 (2002) (discussing that ecstasy is typically cut with cocaine and other drugs, although when MDMA is a large part of ecstasy, the drug quantities are sentenced under MDMA).

97. *MDMA*, THE VAULTS OF EROWID, <http://www.erowid.org/chemicals/mdma/mdma.shtml> (last visited Feb. 21, 2014).

related offenses.⁹⁸ Section 3(b)(1) of the Act specifically directed the Commission to “review and amend the Federal Sentencing Guidelines to provide for increased penalties such that those penalties are comparable to base offense levels for offenses involving any methamphetamine mixture,” which, at that time, had a 1:2000 gram ratio to marijuana.⁹⁹

Pursuant to Congress’s orders, the Sentencing Commission reviewed “the available scientific and popular literature on MDMA,” and requested input from agencies and organizations such as the Department of Justice and the Federal Public and Community Defenders.¹⁰⁰ Upon receiving requests for a public hearing from the general public and from public organizations such as the National Association for Criminal Defense Lawyers, the Commission delayed voting on the amendment in order to hold the requested public hearing.¹⁰¹ Prior to the public hearing, the Commission planned to recommend a 1:1000 drug equivalency ratio, which was identical to the drug equivalency ratio of heroin.¹⁰²

During its decision process, the Commission received and considered hundreds of written submissions “from a diverse array of constituents including clinicians, physicians, psychologists, academic researchers, users, defense attorneys, and other interests groups.”¹⁰³ The Commission considered information from the DEA about increasing trafficking patterns and challenges faced by law enforcement, as well as information from the National Institute on Drug Abuse about the “pharmacological effects and health hazards associated with MDMA.”¹⁰⁴ The Commission also considered information about the increase of MDMA use among the nation’s youth from institutions and organizations such as the University of Michigan, Columbia University, and the Substance Abuse and Mental Health Services Administration.¹⁰⁵

C. The Commission’s Findings

The Ecstasy Anti-Proliferation Act of 2000 specifically directed the Commission to consider and evaluate the following dangers associated with MDMA use:

98. Children’s Health Act of 2000, Pub.L. No. 106-310, §§ 3661–65, (codified at 42 U.S.C. §§ 290aa–5b); U.S. SENT. COMM’N, REP. TO THE CONGRESS: MDMA DRUG OFFENSE, EXPLANATION OF RECENT GUIDELINE AMENDMENTS 2 (2001) [hereinafter MDMA REPORT].

99. Children’s Health Act of 2000 § 3664(b)(1).

100. MDMA REPORT, *supra* note 98, at 3–4, 17.

101. *Id.* at 4 (discussing that at that time the Commission had set forth a preliminary proposal that “would have set the penalties for MDMA trafficking equal to the penalties for heroin trafficking”).

102. *Id.* at 4–5.

103. *Id.* at 4 (noting that the “volume of the public comment received on the proposed changes to the guidelines for MDMA trafficking far exceed[ed] that for any issue this Commission ha[d] addressed since taking office in November 1999”).

104. *Id.* at 3–4.

105. *Id.* at 13–15.

- (A) the rapidly growing incidence of abuse of [MDMA] and the threat to public safety that such abuse poses;
- (B) the recent increase in the illegal importation of [MDMA];
- (C) the young age at which children are beginning to use [MDMA];
- (D) the fact that [MDMA is] frequently marketed to youth;
- (E) the large number of doses per gram of [MDMA]; and
- (F) any other factor¹⁰⁶

With regard to the rapid increase of MDMA-use and the resulting threat to the public, the Commission found persuasive statistics that showed skyrocketing MDMA-related emergency room visits between 1994 and 2000.¹⁰⁷ As of 1994, there were 250 MDMA-related emergency room visits, but as of 1999 there were 2,850 MDMA-related emergency room visits.¹⁰⁸

The Commission also expressed concern regarding the “recent increase in the illegal importation of [MDMA].”¹⁰⁹ To support its concern, the Commission referenced the spike in the amount MDMA that the DEA seized within the past year: the DEA seized one million MDMA tablets in 1999, but seized three million MDMA tablets in 2000.¹¹⁰ The Commission also cited U.S. Customs Service’s seizure of over nine million MDMA tablets in 2000, which was a large increase from the three and a half million tablets seized in 1999, and the mere 400,000 tablets seized in 1997.¹¹¹

With regard to the young age of first-time MDMA users, the Commission expressed particular concern about the “sharp increase in MDMA use among all grade levels, as well as young adults in their early

106. *Id.* at 3.

107. *Id.* at 11 (citing OFF. OF APPLIED STUD., SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMIN. (SAMHSA), *CLUB DRUGS, THE DAWN (DRUG-ABUSE WARNING NETWORK) REP. 2* (2000)).

108. *Id.* at 11. The Commission also mentioned the harm to user, which is discussed in scientific detail elsewhere in the report (and is discussed within this Note later in this section).

109. *Id.* at 3.

110. *Id.* at 12 (citing Statement of Donnie Marshall, Administrator, DEA, before the U.S. Senate Caucus on Int’l Narcotics Control regarding *America at Risk: The Ecstasy Threat*, 2 (March 21, 2001)).

111. *Id.* (citing Statement by Chuck Winwood, Acting Commissioner, U.S. Customs Serv., before the U.S. Senate Caucus on Int’l Narcotics Control regarding *America at Risk: The Ecstasy Threat*, 1 (March 21, 2001)).

twenties.”¹¹² The Commission also noted that, as of 2000, more American teenagers had used MDMA than heroin.¹¹³

Along the same lines, the Commission also worried about the fact that MDMA was being marketed toward a very young demographic.¹¹⁴ Specifically, the Commission was concerned with the ease of access to MDMA, the perception among the youth demographic that MDMA carried a “low risk of harm,” MDMA’s “reputation as a ‘feel good’ drug,”¹¹⁵ and the fact that MDMA was being marketed under popular brand-names such as “Mercedes-Benz” or “Smurfs.”¹¹⁶

Although Congress directed the Commission to consider “the large number of doses per gram of [MDMA],”¹¹⁷ the Commission stated that this type of information was inappropriate within the context of MDMA.¹¹⁸ Instead, the Commission “found more important and persuasive the fact that, because the pills are quite small, large numbers of doses can be transported and imported at one time.”¹¹⁹

Congress also told the Commission to consider “any other appropriate factors.”¹²⁰ In response, the Commission considered the “relevant legislative history” by reviewing testimony from Congressional hearings at which “witnesses from the Commission, [representatives of] law enforcement agencies, researchers, and former MDMA users testified.”¹²¹ The Commission noted that, mere months before Congress passed the Ecstasy Anti-Proliferation Act of 2000, “legislation was emerging from both Houses of Congress that would have required the Commission to increase MDMA penalties” to a level comparable to those for methamphetamine mixtures.¹²²

The Commission also considered feedback from the public.¹²³ The Commission’s report highlights the extensive amount of public comment it

112. *Id.* at 13 (citing Lloyd Johnston et al., “Ecstasy” Use Rises Sharply Among Teens in 2000: Use of Many Other Drugs Steady but Significant Declines Are Reported for Some, UNIV. OF MICH. NEWS & INFO. SERV. (Dec. 14, 2000)), available at <http://www.monitoringthefuture.org/>.

113. *Id.* at 14 (citing P’SHP FOR A DRUG-FREE AM., P’SHP ATTITUDE TRACKING STUDY: SPRING 2000, TEENS IN GRADES 7 THROUGH 12, 11 (2000)).

114. *Id.*

115. *Id.* at 15.

116. *Id.* (citing CEWG, NIH, NIDA, EPIDEMIOLOGIC TRENDS IN DRUG ABUSE, 1 PROCEEDINGS OF THE COMMUNITY EPIDEMIOLOGY WORKING GRP. 76, 79 (2000)).

117. *Id.* at 3.

118. *Id.* at 16 (“Although the Commission was required to consider the large dosage amount per gram of MDMA, the Commission found this information to be inaccurate.”).

119. *Id.* Images of MDMA tablets can be found at *Ecstasy MDMA*, DRUG ENFORCEMENT ADMIN., http://www.justice.gov/dea/pr/multimedia-library/image-gallery/images_ecstasy.shtml (last visited Feb. 22, 2014), and at DRUGS OF ABUSE, *supra* note 90, at 58.

120. MDMA REPORT, *supra* note 98, at 3.

121. *Id.* at 16.

122. *Id.* at 16, n.58.

123. *Id.* at 17.

received while it was deciding how to amend the penalties for MDMA offenses: “Respondents included clinicians, physicians, psychologists, academic researchers, users, defense attorneys, and other interest groups,” as well as organizations such as “the Department of Justice, and the Federal Public and Community Defenders.”¹²⁴

Striving to make the penalty for MDMA-related offenses consistent with the trafficking structure set forth by the DEA, which “generally attempt[s] to distinguish between high level ‘kingpin’ distributors and low level, local distributors,”¹²⁵ the Commission considered the functional roles of offenders in the MDMA distribution network.¹²⁶

Finally, the Commission considered “collateral consequences” such as whether violence, secondary health consequences, or environmental harms were caused by MDMA trafficking and consumption.¹²⁷ The Commission did not find any suggestion that “substantial violence” was associated with MDMA trafficking, and stated that “users of MDMA rarely commit crimes to support their consumption pattern.”¹²⁸ The Commission also did not find any negative secondary health consequences that are sometimes associated with illegal drug use, such as contracting diseases from contaminated needles.¹²⁹ Finally, since the majority of MDMA is imported from other countries, MDMA did “not pose the same risks to the environment as methamphetamine and amphetamine production.”¹³⁰

D. The Commission’s Findings: The Empirical Basis

In making its recommendation to Congress, the Commission reviewed and relied upon empirical data to determine the physiological effects and harms of MDMA. The Commission noted that MDMA caused physical effects such as “an enhanced sense of pleasure and self-confidence, increased energy, feelings of peacefulness, acceptance, empathy, closeness with others, and a desire to be touched.”¹³¹ The Commission was concerned, however, about its conclusion that MDMA

124. *Id.* at 17.

125. *Id.* at 18. The functional roles for MDMA set forth by the DEA are as follows: 50,000 to 100,000 pills indicate an importer; 5,000 to 10,000 pills indicate an upper- or middle-level distributor; 500 to 1,000 pills indicate a local distributor; 50 to 100 pills indicate a hand-to-hand dealer at a rave.

126. *Id.*

127. *Id.* at 16, 18.

128. *Id.* at 19.

129. *Id.*

130. *Id.* Although there are no conclusive estimates of amphetamine production in the United States, a significant amount of amphetamines available in the United States is domestically produced. NAT’L DRUG INTEL. CTR., NAT’L DRUG THREAT ASSESSMENT 2005 (Feb. 2005).

131. MDMA REPORT, *supra* note 98, at 7 (citing NAT’L INST. ON DRUG ABUSE, NAT’L INST. OF HEALTH, NIDA NOTES, FACTS ABOUT MDMA (ECSTASY), PUB. NO. 99-3478, at 15 (1999)).

also produced negative effects such as “increased heart rate and blood pressure, restlessness, jaw clenching, changes in body temperature regulation, increased body temperature, muscle tension, next day hangover, and a strong urge to repeat use,” despite the fact that MDMA is not physically addictive.¹³² The Commission’s report reveals that the Commission was highly influenced by concerns about MDMA’s neurotoxicity.¹³³ Based on the scientific reports it reviewed, the Commission believed that neurotoxicity would result in permanent harm to the brain that would affect important cognitive functions, such as memory.¹³⁴

The Commission formed conclusions about the harms of MDMA, despite the fact that scientists had come to differing conclusions about both the physical and emotional harms of MDMA in its report: “[M]uch, although *not all*, of the research [found] a range of physical and emotional hazards associated with [MDMA] use.”¹³⁵ Despite acknowledging that “[t]he potential toxicity to serotonin neurons . . . ha[d] been the subject of some disagreement,” the Commission also concluded that MDMA was neurotoxic.¹³⁶ Finally, the Commission concluded that MDMA caused permanent physical harm to the user’s brain, despite admitting that “the brain’s elasticity and redundancy may mean that any neurotoxicity caused by the drug may not be meaningful,” and that “[a]nother point of controversy surrounding the MDMA research literature is whether loss and corresponding impairment of these serotonin sites is permanent.”¹³⁷ So, notwithstanding the acknowledged scientific uncertainty, the Commission based its recommendations to Congress on its conclusions about the physical, neurotoxic harms of MDMA.

E. The Commission’s Decision

Ultimately, the Commission declined to follow Congress’s recommendation to treat MDMA as harshly as methamphetamine, and decided against its initial plan to treat MDMA as harshly as heroin.¹³⁸ The Commission unanimously decided on a marijuana equivalency of 500 grams,¹³⁹ which was less than heroin’s equivalency ratio of 1:1000 grams, but more than powder cocaine’s equivalency ratio of 1:200 grams.¹⁴⁰ The

132. *Id.* (citing *MDMA Effects*, THE VAULTS OF EROWID, http://www.erowid.org/chemicals/mdma/mdma_effects.shtml (last visited Feb. 24, 2014)).

133. *Id.* at 8.

134. *Id.*

135. *Id.* at 7 (emphasis added).

136. *Id.* at 8.

137. *Id.* at 9–10.

138. *Id.* at 4–5.

139. That is, a 1:500 ratio of MDMA to marijuana. *Id.* at 5.

140. *Id.* at 4–5. The emergency amendment was promulgated on March 20, 2001, and the permanent amendment was promulgated on April 6, 2001.

Commission justified its decision by comparing the harms of MDMA to the harms of both cocaine and heroin. The Commission chose a lesser ratio than the ratio for heroin because:

(1) there are many more heroin cases in the federal system than MDMA cases, (2) heroin is more addictive than MDMA, (3) heroin has many more emergency room visits and deaths associated with its use than MDMA because, unlike MDMA which generally is taken orally, heroin is injected, (4) heroin has more violence associated with both its users and distribution system than MDMA, in part because MDMA users typically do not resort to violence to support their drug use, and (5) heroin causes greater secondary health effects, such as the spread of HIV and hepatitis, because it is injected.¹⁴¹

The Commission chose a greater ratio than the ratio for powder cocaine, determining that MDMA was more harmful than cocaine, because “(1) unlike MDMA, powder cocaine is not neurotoxic, (2) powder cocaine is not as aggressively marketed to youth in the same manner as MDMA, and (3) powder cocaine is only a stimulant, but MDMA acts as both a stimulant and a hallucinogen.”¹⁴²

The Commission believed that a 1:500 MDMA-to-marijuana ratio was appropriate because of “the unique pharmacological and physiological harms of ecstasy, the fact that the drug is aggressively marketed to and used by our youth, and its importation and trafficking pattern.”¹⁴³ This increased ratio resulted in a 115% increase in MDMA-related prison sentences, which increased the average prison sentence of an offender from thirty-four months to seventy-three months.¹⁴⁴ The ratio currently remains at 1:500, and has not been reevaluated since 2001.

III. CORE PROBLEMS WITH THE MDMA DRUG EQUIVALENCY RATIO

The Commission overstated the harms of MDMA in its report, which resulted in a drug equivalency ratio that is disproportionate to the risks and harms of MDMA. This section analyzes the science on which the Commission relied when making a decision about an appropriate MDMA drug equivalency ratio, pointing out the ways in which that science was incomplete and likely inaccurate. Next, this section discusses the failure of the Commission to adequately compare MDMA to other drugs with regard to the social harms caused by using and trafficking MDMA. This section

141. *Id.* at 5.

142. *Id.*

143. *Id.*

144. *Id.*

concludes by discussing the currently unresolved split amongst the federal circuit courts regarding whether to defer to the Commission's MDMA equivalency ratio.

A. Empirical Problems with the Ratio

Much of the science on which the Commission's 2001 decision was based is likely inaccurate. The science on which the Commission's decision was based suffered from uncontrolled extraneous variables, and many studies were conducted by a scientist who employed questionable—if not entirely dishonest—methods. Further, recent science shows that the claim that MDMA is neurotoxic may be incorrect. More importantly, however, modern science does not support the Commission's beliefs about the extent of MDMA's physiological harms. The Commission also failed to consider valid scientific evidence about MDMA's cardiotoxicity.¹⁴⁵ The combination of these mistakes renders the Commission's 2001 decision unjustified, and creates the need for the Commission to reevaluate the current MDMA drug equivalency ratio.

1. The Commission's Reliance on Unsound Science

As discussed in Section II, the Commission relied on several different scientific studies in an attempt to determine the nature and extent of the harms caused by MDMA use. The Commission's reliance on these scientific studies, however, is problematic. Many of the studies on which the Commission relied were conducted by a scientist who later had to withdraw much of his work on MDMA. This calls into question the credibility and integrity of almost all of the scientific studies cited in the Commission's 2001 decision. Further, many of the scientific studies that the Commission cites are scientifically unsound. The studies were performed on a variety of non-human subjects, and extraneous variables were not adequately controlled for.

The Commission's decision about the extent of MDMA's physiological harms was highly influenced by its concerns about MDMA's neurotoxicity—specifically MDMA's effect on serotonin transmitters (“SERT”)¹⁴⁶ and potential permanent harm resulting therefrom.¹⁴⁷ A significant amount of the scientific research that the Commission used to justify its concerns about neurotoxicity, however, is untrustworthy. One of

145. According to the National Cancer Institute, cardiotoxicity is “toxicity that affects the heart.” Cardiotoxicity includes “a direct effect of [a] drug on the heart [and] also an indirect effect” due to increased blood flow or blood clot formation in blood vessels.

I. Brana & J. Taberero, *Cardiotoxicity*, 21 *ANNALS OF ONCOLOGY* vii173–vii179 (2010).

146. Serotonin transmitters take up and inactivate serotonin. LARRY R. SQUIRE, *FUNDAMENTAL NEUROSCIENCE* 143 (3d ed. 2008).

147. *Id.* at 8.

the main researchers involved in many of these studies, George Ricaurte, has employed methods that call into question his integrity as an objective scientist. At the time of the Commission's decision, Ricaurte's work was the subject of severe peer criticism.¹⁴⁸ Scientists criticized his methodologies and failure to account for extraneous variables and extenuating circumstances.¹⁴⁹ Additionally, several medical and research professionals publically criticized Ricaurte's work during the Commission's hearings.¹⁵⁰

Despite this criticism, however, the Commission attempted to justify its reliance on the controversial scientist's studies in two different ways. First, the Commission stated that Ricaurte was a "leading researcher in MDMA toxicity studies."¹⁵¹ Ricaurte was the main researcher funded by the government to research MDMA neurotoxicity, receiving millions of dollars in funding between 1989 and 2002.¹⁵² Second, the Commission claimed that, because Ricaurte's "work has appeared in peer-reviewed scientific journals of excellent reputation," the "method[s] of peer review and dissemination" make the studies credible.¹⁵³

Since the Commission's 2001 decision, Ricaurte has been surrounded by scandal. In 2003, Ricaurte was forced to retract a study published in *Science* that concluded that the amount of MDMA typically consumed by a recreational user in a single night could cause permanent brain damage.¹⁵⁴ The \$1.3 million study had used methamphetamine instead of MDMA, rendering all of the results invalid.¹⁵⁵ Ricaurte had to withdraw four additional papers, because methamphetamine was also used instead of MDMA in four other studies performed in his lab.¹⁵⁶ Although Ricaurte stands behind his conclusions about the harms of MDMA, numerous well-respected scientists have made allegations that Ricaurte's work is unsound. Ricaurte has been accused of "playing games with his data" to make drugs

148. *Id.* at 8, n.15.

149. *See* Grob, *supra* note 87, at 563–66, 573–79. Specific methodological problems will be discussed later in this section.

150. MDMA REPORT, *supra* note 98, at 8 n.15. Ricaurte's studies were "severely criticized by several medical/research professionals who publically commented to the Commission during its review of the MDMA penalties." *Id.*

151. *Id.*

152. Ilsa Jerome, *NIDA & NCRR Funding for Ricaurte & McCann*, MAPS (2004), available at <http://www.maps.org/mdma/ricaurtefunding.pdf> (discussing that Ricaurte and McCann, Ricaurte's wife with whom he frequently works, received over \$14.6 million dollars for MDMA and MDMA-related research between 1989 and 2002).

153. MDMA REPORT, *supra* note 98, at 8 n.15 (this proposition was apparently supported by "at least one critic" who is not named in the Commission's report).

154. Donald G. McNeil Jr., *Research on Ecstasy Is Clouded by Errors*, N.Y. TIMES, Dec. 2, 2003, at F1.

155. *Id.* The monkeys in the study were injected with overdoses of methamphetamine, killing two of the 10 monkeys.

156. *Id.* (Ricaurte claiming the labels on vials he bought in 2000 had been "somehow switched").

look bad in order to win more federal grants¹⁵⁷ and “running a cottage industry showing that everything under the sun is neurotoxic.”¹⁵⁸ Subjects from Ricaurte’s studies have also reported that Ricaurte used unsound methodologies, such as administering memory tests while subjects are jet-lagged and being told “what not to admit . . . if they wanted to be in the [compensated] study.”¹⁵⁹ For obvious reasons, Ricaurte’s credibility has been tarnished, making the integrity and reliability of his scientific studies even more questionable.

The Commission relied heavily on George Ricaurte’s scientific research in its report to Congress.¹⁶⁰ Although the Commission’s report to Congress cites the work of six scientists¹⁶¹ to support the conclusion that MDMA is neurotoxic and has long-lasting effects on SERT, almost half of the studies to which the Commission cites were performed by George Ricaurte.¹⁶² Further, although Ricaurte was not always the lead or sole scientist who conducted the studies to which the Commission cited, he was involved in every single study.¹⁶³ The Commission relied on Ricaurte’s animal-based studies to support the conclusion that MDMA users who consumed normal recreational doses of MDMA risked suffering lasting and significant neurotoxic effects like damage to SERT nerve fibres¹⁶⁴ resulting in “significant impairments in visual and verbal memory.”¹⁶⁵ The Commission also relied on these studies to support the conclusion that MDMA impairs working memory,¹⁶⁶ which is critical to cognitive reasoning, attention, and comprehension.¹⁶⁷ In summary, essentially all of

157. *Id.* at F4 (quoting Dr. Julie Holland, a professor of psychiatry at New York University).

158. *Id.* (quoting Dr. Richard J. Wurtman, a “prominent clinician at Harvard and M.I.T.”).

159. *Id.* (summarizing two subjects’ descriptions of their participation in a 1996 study).

160. See GUIDELINE AMENDMENTS, *supra* note 48, at 8–10. The section also cites two scientific studies (by George Battaglia and James P. O’Callaghan) that do not support the conclusion that MDMA has lasting neurotoxic effects, but it dedicates almost no discussion to these studies and seemingly dismisses them. *Id.* at 8, 10 nn.14, 22.

161. *Id.* at 8–10 nn.13, 15–21, 23. (K.M. Hegadoren, Meltem Demirkian, George Ricaurte, Robart Mathias, Euphrosyne Gouzoulis-Mayfrank, and G. Hatzidimitriou).

162. *Id.* at 8–10.

163. *Id.*

164. *Id.* at 8–9 nn.16-17 (citing George Ricaurte et al., (+ –) 3,4-Methylenedioxymethamphetamine (‘Ecstasy’)-Induced Neurotoxicity: *Studies in Animals*, 42 NEUROPSYCHOBIOLOGY 5–10 (2000)).

165. *Id.* at 9 (emphasis added) (citing ROBERT MATHIAS, NIDA NOTES, “ECSTASY” DAMAGES THE BRAIN & IMPAIRS MEMORY IN HUMANS, PUB. NO. 99-3478, 10–11 (1999)). Although the Commission cites to Mathias, a secondary source, the information referred to ultimately is drawn from the following study: U.D. McCann et al., *Positron Emission Tomographic Evidence of Toxic Effect of MDMA (‘Ecstasy’) on Brain Serotonin Neurons in Human Beings*, 352 LANCET 1433 (1998) (G.A. Ricaurte is the fourth author of the study).

166. MDMA REPORT, *supra* note 98, at 9–10 n.21.

167. Nelson Cowan, *What Are the Differences Between Long-term, Short-term, and Working Memory?*, 169 PROG. IN BRAIN RES. 323 (2008).

the Commission's conclusions about the physical harms of MDMA are based on Ricuarte's studies.

In addition to Ricuarte's credibility problems, the scientific studies upon which the Commission relied were rife with methodological errors. Many of the scientific studies used by the Commission in forming its 2001 decision cannot adequately establish a causal relationship to MDMA and harms to human users. These studies used animals rather than humans as subjects.¹⁶⁸ In order to accurately predict MDMA-related harms for humans, animal-based studies must use doses of MDMA that are functionally equivalent to recreational doses of MDMA.¹⁶⁹ Many scientists have concerns, however, "as to whether the administered dose of MDMA typically used to cause neurotoxicity in [animals] allows any translational projections to be made as to the doses required to produce similar damage in the brains of humans following recreational use of [MDMA]."¹⁷⁰ These animal-based studies have also been criticized as flawed, because they neglected to consider and account for "interspecies differences in . . . drug metabolism."¹⁷¹ Specifically problematic is Ricuarte's use of monkeys, which appear to "have far more sensitivity to [MDMA]'s neurochemical effects, and even at relatively low doses sustain persistent measurable effects."¹⁷²

Yet another methodological concern stems from the failure to control for extraneous variables such as impure MDMA and simultaneous polydrug use¹⁷³ by subjects during the studies. Even at the time of the Commission's decision, it was clear that establishing a scientifically sound causal relationship between physiological harms and MDMA would be challenging¹⁷⁴ because of the frequent adulteration of MDMA tablets.¹⁷⁵ "By the mid-1990s, the average MDMA tablet contained no more than forty percent MDMA."¹⁷⁶ Further, MDMA users regularly used other illicit drugs

168. See, e.g., G. Hatzidimitriou et al., *Altered Serotonin Innervation Patterns in the Forebrain of Monkeys Treated with MDMA Seven Years Previously: Factors Influencing Abnormal Recovery*, 191 *J. NEUROSCIENCE* 5096 (1999) cited in MDMA REPORT, *supra* note 98, at 10 n.23.

169. A.R. Green et al., *MDMA: On the Translation from Rodent to Human Dosing*, 204 *PSYCHOPHARMACOLOGY* 375 (2009).

170. *Id.*

171. *Id.* (stating that Ricuarte's use of interspecies scaling has never shown to be valid for MDMA).

172. Grob, *supra* note 87, at 549.

173. A common dictionary definition of "polydrug" is, "of, relating to, or being the abuse of more than one drug especially when illicit." *Polydrug*, MERRIAM-WEBSTER DICTIONARY, <http://www.merriam-webster.com/medical/polydrug> (last visited Feb. 24, 2014).

174. It was also clear that the causal relationship had not yet been established to any reasonable degree of scientific certainty.

175. Karch, *supra* note 86, at 21.; see also HOLLAND, *supra* note 16, at 71.

176. Karch, *supra* note 86, at 21 (stating the remaining portion of the tablets typically contained other ingredients such as amphetamines, aspirin, caffeine, ephedrine, and even other hallucinogens); see also HOLLAND, *supra* note 16, at 71.

simultaneously with MDMA.¹⁷⁷ This frequent polydrug use was not properly accounted for in studies on which the Commission relied to conclude that MDMA was neurotoxic.¹⁷⁸ In at least one study, a drug-history questionnaire of the subjects was completely absent.¹⁷⁹ Other methodological problems include selecting subjects who were “unarguably heavy users of [MDMA],”¹⁸⁰ and a failure to remove outliers.¹⁸¹

2. Modern Science: MDMA May Not Be Neurotoxic

Current empirical data about MDMA and its effects is still not entirely settled or conclusive. In fact, even within the past few years, “despite a plethora of human and animal studies spanning more than two decades, experts in psychopharmacology cannot reach consensus, with some recently claiming MDMA to be largely innocuous and others proclaiming a clear link between MDMA use and psychopathology.”¹⁸² Despite the fact that science has not provided conclusive answers to questions about the harms of MDMA, modern research indicates that the Commission very likely overstated the harms of MDMA.

At the time of its decision in 2001, the Commission acknowledged that “the potential toxicity to [SERT] . . . ha[d] been the subject of some disagreement.¹⁸³ The Commission failed, however, to dedicate any significant amount of discussion to both sides of the disagreement.¹⁸⁴ The Commission’s report cites, in a mere footnote, a scientific study reporting an “*absence* of certain chemical markers indicative of neurotoxicity,” which was performed by the head of the Molecular Neurotoxicology Laboratory, Toxicology, and Molecular Biology Branch of The Centers for Disease Control and Prevention.¹⁸⁵ The Commission drastically understated the extent of the conflicting scientific information when it stated that there was

177. HOLLAND, *supra* note 16, at 71.

178. See GUIDELINE AMENDMENTS, *supra* note 48, at 9 n.18; Grob, *supra* note 87, at 576–77.

179. Grob, *supra* note 87, at 576–77 (“Essential data characterizing these two groups, however, is missing. Although investigators say they administered a drug-history questionnaire to their subjects, these critical results are absent from the report.”).

180. *Id.* (reporting results from these groups were then extrapolated to “occasional (or one-time) low dose MDMA [use]”).

181. Grob, *supra* note 87, at 577. “Indeed, if one removes the one outlier subject and the 15 controls who had been included to weight the correlative curve, a new regression analysis reveals no statistically significant correlation between MDMA use and transporter density.” *Id.*

182. Murray R. Thompson et al., *The Psychopharmacology of MDMA*, in THE HEALTH AND PSYCHOLOGICAL EFFECTS OF “ECSTASY” (MDMA) USE (Louisa Degenhardt & Wayne Hall eds., 2010).

183. See MDMA REPORT, *supra* note 98, at 8 n.14.

184. *Id.*

185. *Id.* at 8 (citing James P. O’Callaghan, CTR. FOR DISEASE CONTROL & PREVENTION, *Defining Neurotoxicity: Lessons from MDMA & Other Amphetamines* (2001)(emphasis added)). This study was submitted to the U.S. Sentencing Commission on March 21, 2001.

merely “some disagreement” over conclusions about MDMA’s neurotoxicity.¹⁸⁶ By 2001, many studies suggested that MDMA may not be neurotoxic. For example, a 1995 study showed that MDMA neurotoxicity was “dependent upon high core temperatures,” and that avoiding hyperthermic states reliably blocked SERT damage.¹⁸⁷ This means that when an MDMA user’s core body temperature is normal (i.e., not elevated by excessive physical exertion or a warm, poorly ventilated environment), there will not likely be any neurotoxic effects from MDMA use. Additionally, a 1998 study showed no statistically significant correlation between MDMA use and SERT density (i.e., neurotoxicity) when the one outlier subject was removed.¹⁸⁸

Although modern science cannot yet definitely answer every question about MDMA’s physical harms, it has provided further clarification. A 2011 study that was designed to assess MDMA’s neurotoxicity failed to find any “marked residual cognitive effects in ecstasy users.”¹⁸⁹ The study was carefully designed to minimize any “possible sources of bias” and “limitations found in many prior investigations.”¹⁹⁰ The study utilized a proper control group and excluded participants who had “significant life-time exposure to other illicit drugs or alcohol.”¹⁹¹ It also required MDMA-using participants to “be members of the ‘rave’ subculture,” and it thoroughly drug tested all participants to exclude any possible unreported substance abuse.¹⁹² A 1999 and 2002 study, both of which used PET scans to examine neurotoxic effects on the dopamine systems of MDMA users, did not find any neurotoxic changes—temporary or permanent—in the users’ brains.¹⁹³

186. *Id.*

187. Grob, *supra* note 87, at 570 n.152 (citing M. I. Colado et al., *The Hyperthermic and Neurotoxic Effects of ‘Ecstasy’ (MDMA) and 3,4 Methylenedioxyamphetamine (MDA) in the Dark Agouti (DA) Rat, a Model of the CYP2D6 Poor Metabolizer Phenotype*, 115 BRITISH J. PHARMACOLOGY 1281 (1995); H.W. Broening et al., *Age-Dependent Sensitivity of Rats to the Long-Term Effects of the Serotonergic Neurotoxicant 3,4 Methylenedioxymethamphetamine (MDMA) Correlates with the Magnitude of the MDMA-Induced Thermal Response*, 275 J. PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS 325 (1995)).

188. Grob, *supra* note 87, at 570 (referring to the PET scan study discussed on page 9 of the MDMA report, Grob states, “Indeed, if one removes the one outlier subject and the 15 controls who had been included to weight the correlative curve, a new regression analysis reveals no statistically significant correlation between MDMA use and transporter density.”).

189. John H. Halpern et al., *Residual Neurocognitive Features of Long-Term Ecstasy Users with Minimal Exposure to Other Drugs*, 106 ADDICTION 777 (April 2011).

190. *Id.*

191. *Id.*

192. *Id.*

193. L. Reneman et al., *Use of Amphetamine by Recreational Users of Ecstasy (MDMA) Is Associated with Reduced Striatal Dopamine Transporter Densities: A [123I]beta-CIT SPECT Study—Preliminary Report*, 159 PSYCHOPHARMACOLOGY (BERLIN) 335 (2002); D. M. Semple et al., *Reduced In Vivo Binding to the Serotonin Transporter in the Cerebral Cortex of MDMA (‘Ecstasy’) Users*, 175 BRITISH J. PSYCHIATRY 63 (1999).

Not all studies conclude that MDMA is not neurotoxic;¹⁹⁴ however, the meticulously well-designed studies that have not found any evidence of neurotoxicity make it likely that the Commission's conclusion that MDMA causes significant neurotoxic damage to MDMA user's brains is incorrect. At a minimum, these studies demonstrate the need for the Commission to reevaluate the physical harms of MDMA and to implement a drug equivalency ratio reflective of the seriousness of those harms.

3. Modern Science: MDMA Likely Does Not Cause Significant or Lasting Neurological Harm

As previously discussed, modern science cannot yet definitively answer the question of whether MDMA is neurotoxic. Despite modern science not being completely settled, however, recent studies have made progress and have clarified details about the harms caused by MDMA use and details about the extent and permanence of those harms. A vast amount of current scientific studies conclude that even if MDMA is neurotoxic, it is highly likely the resulting neurological harm to the user is impermanent and insignificant.

As previously mentioned, the Commission relied on Ricaurte's animal-based studies to conclude that MDMA users who consumed normal recreational doses of MDMA risked suffering permanent, significant neurotoxic effects like damage to SERT nerve fibres.¹⁹⁵ The Commission concluded that these neurotoxic effects cause "significant impairments in visual and verbal memory"¹⁹⁶ and believed this damage to be long lasting, if not permanent.¹⁹⁷

The Commission acknowledged, however, that some studies suggested that any damage to SERT from MDMA use was temporary, citing a study that found "complete neuronal regeneration in rats [a mere] twelve months after they were exposed to MDMA."¹⁹⁸ The Commission's report, however, discounted these studies by citing an opposing study immediately thereafter that found "damage to serotonin sites" in squirrel

194. See, e.g., Margaret Benningfield & R.L. Cowan, *Brain Serotonin Function in MDMA (Ecstasy) Users: Evidence for Persisting Neurotoxicity*, 38 NEUROPSYCHOPHARMACOLOGY 253 (2008).

195. GUIDELINE AMENDMENTS, *supra* note 48, at 8–9 (citing George Ricaurte et al., (+ –) 3,4-Methylenedioxymethamphetamine ('Ecstasy')-Induced Neurotoxicity: *Studies in Animals*, 42 NEUROPSYCHOBIOLOGY 5 (2000)).

196. *Id.* at 9; see *supra* note 165.

197. GUIDELINE AMENDMENTS, *supra* note 48, at 10 (citing G. Hatzidimitriou et al., *Altered Serotonin Innervation Patterns in the Forebrain of Monkeys Treated with MDMA Seven Years Previously: Factors Influencing Abnormal Recovery*, 191 J. NEUROSCIENCE 5096 (1999)). Ricaurte is named as the third author of this study.

198. *Id.* at 10 (citing George Battaglia et al., NIDA, *MDMA-Induced Neurotoxicity: Parameters of Degeneration of Recovery of Brain Serotonin Neurons*, 29 PHARMACOLOGY, BIOCHEMISTRY, & BEHAVIOR 269 (1988)).

monkeys that “persisted at least seven years after exposure” to MDMA.¹⁹⁹ Strangely, however, this study did not contain any information or discussion about whether behavioral or functional changes in the monkeys occurred.²⁰⁰ Nonetheless, the Commission concluded that SERT damage from MDMA use was, at minimum, long-lasting.²⁰¹ The Commission included little information about studies indicating that MDMA was either not neurotoxic or that any neurotoxic effects were temporary and insignificant.

Studies have shown, however, that even after repeated exposure to high doses of MDMA, serotonin nerve fibres do regenerate over time, “with a gradual yet measurable increase in nerve fibredensity.”²⁰² A 1993 study showed that “low dose therapeutic” doses of MDMA, taken biweekly for a period of four months, did not produce any lasting or functional effects.²⁰³ More recently, a 2004 study found no statistically significant difference between the performance of MDMA users and non-users on neuropsychological tests.²⁰⁴ The study results showed that moderate users displayed “virtually no differences from non-users on any measures” of functional cognitive defects.²⁰⁵ This study has been corroborated by other studies.²⁰⁶

Science shows, then, that any potential neurotoxicity is highly unlikely to be permanent or significant. This is of great importance, because the Commission’s decision assumed that neurological harm from neurotoxicity was permanent and would have tangible and significant consequences on vital functions like working memory, visual memory, and verbal memory.²⁰⁷ If neurological harm does not result in functional or lasting harm to users, the debate about neurotoxicity itself seems irrelevant, because the Commission aims not to evaluate scientifically interesting

199. *Id.* (citing G. Hatzidimitriou, *Altered Serotonin Innervation Patterns in the Forebrain of Monkeys Treated With MDMA Seven Years Previously: Factors Influencing Abnormal Recovery*, 191 J. NEUROSCIENCE 5096 (1999)).

200. Grob, *supra* note 87, at 569 n.152.

201. GUIDELINE AMENDMENTS, *supra* note 48, at 10.

202. Grob, *supra* note 87, at 561 n.152 (citing M. E. Molliver et al., *Neurotoxicity of MDMA & Related Compounds: Anatomic Studies*, 600 ANNALS N.Y. ACAD. SCI. 649 (1990)).

203. *Id.* at 563 (citing R. Karel, *Fluoxetine May Protect Against MDMA Neurotoxicity* PSYCHIATRIC NEWS (Aug. 6, 1993)). The study noted that this fact was established by Ricaurte, who for political reasons or otherwise, never published this information in “the mainstream scientific literature.”

204. J. Halpern et al., *Residual Neuropsychological Effects of Illicit 3,4-Methylenedioxymethamphetamine (MDMA) in Individuals with Minimal Exposure to Other Drugs*, 75 DRUG & ALCOHOL DEPENDENCE 135 (2004).

205. *Id.*

206. See, e.g., Michael Lyvers & Penelope Hasking, *Have Halpern et al. (2004) Detected ‘Residual Neuropsychological Effects’ of MDMA? Not Likely.*, 75 DRUG & ALCOHOL DEPENDENCE 149 (2004).

207. GUIDELINE AMENDMENTS, *supra* note 48, at 9.

microbiological neurological changes, but rather aims to evaluate actual *harm* to users.

4. Physiological Harms the Commission Ignored

While modern scientific studies tend to reveal that MDMA is not as harmful as the Commission believed it to be in 2000, recent studies have also revealed a different harm that was not previously suspected: cardiotoxicity. Cardiotoxicity cannot justify a continued reliance on the current MDMA drug equivalency ratio due to the small number of affected users; however, this serves as yet another example of the Commission's inadequate and incomplete 2001 analysis of the harms of MDMA.

Recent scientific studies provide evidence that MDMA is cardiotoxic. Although the causal relationship between MDMA and myocardial fibrosis²⁰⁸ has not been conclusively proven in a controlled laboratory setting, MDMA users frequently present with myocardial fibrosis.²⁰⁹ This suggests that there may be a correlation between MDMA use and myocardial fibrosis. A causal relationship between the two will likely be exceptionally difficult to establish, however, since methamphetamine, a drug known to cause cardiac fibrosis, is often mixed with MDMA in 'ecstasy' tablets.²¹⁰ There have also been reports of MDMA-related cardiomyopathy,²¹¹ although this, too, has not yet been replicated in a controlled laboratory setting.²¹² Recent science strongly supports the conclusion that MDMA can cause valvular heart disease. A 2007 blind study tested twenty-nine MDMA users and twenty-nine non-users who were age- and gender-matched.²¹³ The study revealed that approximately one-third of the MDMA-users had abnormal echocardiograms, "compared with none in the control group."

208. Myocardial fibrosis, which is sometimes referred to as cardiac fibrosis, occurs when fibrous tissue forms in the heart. See Ping Kong et al., *The Pathogenesis of Cardiac Fibrosis*, 71 CELLULAR & MOLECULAR LIFE SCI. 549 (2014).

209. Karch, *supra* note 86, at 22.

210. *Id.*

211. "Cardiomyopathy refers to diseases of the heart muscle," which cause the heart muscle to become "enlarged, thick or rigid." *What Is Cardiomyopathy?*, NAT'L HEART, LUNG, & BLOOD INST., <http://www.nhlbi.nih.gov/health/health-topics/topics/cm/> (last visited Feb. 21, 2014). Ultimately, cardiomyopathy weakens the heart and can result in heart failure or arrhythmias. *Id.*

212. Karch, *supra* note 86, at 22 ("Case reports describing MDMA-related cardiomyopathy appear sporadically, but no controlled trials, in man or animal, have ever been published. Rats exposed to high doses of MDMA do develop eccentric left ventricular dilation and diastolic dysfunction . . . though whether these changes occur in humans is impossible to say.")

213. *Id.* at 22–23 (citing S. Droogmans et al., *Possible Association Between 3, 4-Methylenedioxymethamphetamine Abuse & Valvular Heart Disease*, 100 AM. J. CARDIOLOGY, 1442 (2007)).

Although MDMA can likely cause heart disease, modern science also has shown that valvular heart disease is reversible and that the number of MDMA users who actually present with this disease “is so low as to hardly be worth a mention.”²¹⁴ As such, MDMA’s potential cardiotoxicity cannot justify continued use of the current MDMA drug equivalency ratio without further reevaluation from the Commission.

B. The Commission’s Social Concerns

In addition to being based on empirical evidence about MDMA’s physiological harms, the Commission’s 2001 decision was also based on numerous social concerns. Recent data supports the Commission’s findings and concerns about the prevalence of MDMA usage among the nation’s youth, the general rise in popularity of MDMA use, and the increase in MDMA trafficking patterns; however the data does *not* support the Commission’s ranking of MDMA’s social harms relative to other illicit drugs, such as cocaine. A review of both current and then-existing data clearly shows that, on the whole, cocaine is much more harmful than MDMA. Despite this, MDMA’s drug equivalency ratio is 250% higher than cocaine’s. Because the Commission’s 2001 decision was primarily based on a comparison of MDMA to cocaine and heroin, the fact that cocaine is much more harmful than MDMA clearly shows that the current MDMA ratio is fatally flawed.

1. Harm to America’s Youth

Although recent data generally supports the Commission’s concerns about MDMA perception and use among the nation’s youth demographic, a comparison of youth perception and use of MDMA and youth perception and use of drugs such as cocaine and marijuana show that this concern cannot justify MDMA’s current 500:1 ratio.

The Commission’s report states that the Commission was concerned about MDMA’s impact on the nation’s youth demographic. This concern was justified by data that revealed “sharp increases in MDMA use among all grade levels, as well as young adults in their early 20s,” as well as with the availability of the drug to the youth.²¹⁵ The Commission was also concerned with the fact that MDMA was being marketed toward the youth in the rave circuit and in schools, commonly with “brand” or “designer” names imprinted on the MDMA, as well as with the youth’s perception of MDMA as a low-risk “feel good” drug.²¹⁶

Recent data suggests that the Commission’s concern about the youth’s perception of MDMA was valid. Statistics show a sharp decrease in

214. *Id.*

215. GUIDELINE AMENDMENTS, *supra* note 48, at 13, 15.

216. *Id.* at 15.

the percentage of eighth through twelfth graders who perceive MDMA use as harmful.²¹⁷ In fact, the percentage of eighth and tenth graders who perceive MDMA as harmful is lower than it was in 2001, with only 25% of eighth graders and 37% of tenth graders seeing great risk in trying ecstasy.²¹⁸ Also supporting the Commission's concern is data revealing that the perception of the harmfulness of cocaine is much higher than that of MDMA: 43% of eighth graders and 53% of tenth graders thought trying powder cocaine once or twice involved great risk.²¹⁹

MDMA usage among teens and young adults also remains prevalent. Recent statistics show that MDMA use among the youth demographic may, once again, be on the rise. The percentage of twelfth-grade MDMA users declined by more than 50% in the aftermath of harsher MDMA guidelines; however, use among twelfth graders has gradually risen since 2005.²²⁰ Since 2005, there has been a "modest rebound" in MDMA use among middle school and high school students, and in 2010 there was a "significant increase [in MDMA use]" in eighth and tenth grade.²²¹ According to the 2011 National Drug Threat Assessment authored by the National Drug Intelligence Center, "MDMA use is increasing, reaching the highest levels of use since 2002."²²² "Clearly the very substantial decline in ecstasy use has ended, and we may be seeing a rebound in the use of this drug" among teenagers.²²³

Despite these increased rates of use, however, MDMA use among teens does not justify the 500:1 ratio when compared with other types of drug use among teens. In 2012, 2% of eighth graders, 5% of tenth graders, and 7.2% of twelfth graders reported having used MDMA at least one time.²²⁴ The number of teens who had used cocaine was lower, but not drastically lower, with 1.9% of eighth graders, 3.3% of tenth graders, and

217. LLOYD D. JOHNSTON ET AL., 1 MONITORING THE FUTURE: NAT'L SURVEY RESULTS ON DRUG USE, 1975–2013: OVERVIEW, KEY FINDING ON ADOLESCENT DRUG USE 35 (2014), available at <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2013.pdf> ("From 2004 to 2011 we saw a troubling drop in perceived risk (first among eighth and tenth, and then among twelfth graders) . . . [suggesting] a generational forgetting of the dangers of ecstasy use resulting from generational replacement.").

218. LLOYD D. JOHNSTON ET AL., INST. FOR SOC. RES., UNIV. OF MICH., MONITORING THE FUTURE: NAT'L SURVEY RESULTS ON DRUG USE, 1975–2011: VOLUME I, SECONDARY SCHOOL STUDENTS 155 (2012), available at http://www.monitoringthefuture.org/pubs/monographs/mtf-vol1_2011.pdf [hereinafter MONITORING THE FUTURE 2012].

219. *Id.*

220. *Id.* at 155–56.

221. *Id.*; NAT'L DRUG INTEL. CTR., NAT'L DRUG THREAT ASSESSMENT 2011, 32 (2011), available at <http://www.justice.gov/archive/ndic/pubs44/44849/44849p.pdf> [hereinafter NAT'L DRUG ASSESSMENT 2011].

222. NAT'L DRUG ASSESSMENT 2011, *supra* note 221, at 32.

223. MONITORING THE FUTURE 2012, *supra* note 218, at 166.

224. LLOYD D. JOHNSTON ET AL., INST. FOR SOC. RES., UNIV. OF MICH., MONITORING THE FUTURE: NAT'L SURVEY RESULTS ON DRUG USE, 1975–2012: VOLUME I, SECONDARY SCHOOL STUDENTS 111 (2013), available at http://www.monitoringthefuture.org/pubs/monographs/mtf-vol1_2012.pdf. [hereinafter MONITORING THE FUTURE 2013].

4.9% of twelfth graders reporting having previously used cocaine.²²⁵ Data from 2011 also reveals similar rates of use of MDMA and cocaine. In 2011, 2.6% of eighth graders, 6.6% of tenth graders, and 8% of twelfth graders said that they had previously used MDMA.²²⁶ Again, the number of teens who had used cocaine was lower, but not drastically lower: 2.2% of eighth graders, 3.3% of tenth graders, and 5.2% of twelfth graders admitted using cocaine previously.²²⁷ Further, in 2013 the DEA reported an overall decline in MDMA use among the youth demographic since 2010.²²⁸ Most compelling, however, is data about the number of teens who have previously used marijuana—which carries a Guidelines penalty 500 times lower than MDMA: 16.4% of eighth graders, 34.5% of tenth graders, and 45.5% of twelfth graders reported having previously used marijuana.²²⁹

2. Emergency Room Data

Emergency room data concerning young MDMA users may generally support the Commission's concerns about MDMA's effect on teens and young adults, as well as its concerns about an increase in MDMA use. Current data, however, continues to show that cocaine, which carries a significantly smaller Guidelines penalty, results in a much greater percentage of serious bodily injury and emergency room visits.

MDMA-related emergency room visits have increased by 114% from 2004 through 2010.²³⁰ The increase was gradual from 2004-2010, but “appear[s] to [have] stabilize[d] between 2009 and 2010.”²³¹ Estimates for 2011 MDMA-related emergency room visits also support the notion that this number is stabilizing.²³² The vast majority of these MDMA-related emergency room visits occurred among 12 to 24 year-olds, while the

225. *Id.*

226. MONITORING THE FUTURE 2012, *supra* note 218, at 107.

227. *Id.*

228. DRUG ENFORCEMENT ADMIN., NAT'L DRUG THREAT ASSESSMENT 2013, 17 (2013), available at <http://www.justice.gov/dea/resource-center/DIR-017-13%20NDTA%20Summary%20final.pdf> [hereinafter NAT'L DRUG ASSESSMENT 2013] (drawing its conclusion from Monitoring the Future data, which showed a decline in MDMA use from 3.06% in 2010 to 3.1% in 2011, and National Survey on Drug Use and Health data, which showed a decline in MDMA use from 1.7% in 2010 to 1.9% in 2011).

229. MONITORING THE FUTURE 2012, *supra* note 218, at 107.

230. U.S. DEP'T OF HEALTH & HUMAN SERVS., SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN., DRUG ABUSE WARNING NETWORK 2010: NAT'L ESTIMATES OF DRUG-RELATED EMERGENCY DEP'T VISITS (2012), available at <http://www.samhsa.gov/data/2k13/DAWN2k10ED/DAWN2k10ED.pdf> [hereinafter DAWN]. There were 10,227 MDMA-related Emergency Room visits in 2004, compared to 21,836 in 2010.

231. DAWN, *supra* note 230, at 39.

232. U.S. DEP'T OF HEALTH & HUMAN SERVS., SUBSTANCE ABUSE & MENTAL HEALTH SERVS. ADMIN., NAT'L ESTIMATES OF DRUG-RELATED EMERGENCY DEP'T VISITS, 2004-2011 0 ILLICITS (EXCLUDING ALCOHOL) (2011), available at http://www.samhsa.gov/data/DAWN.aspx#DAWN_2011_ED_Excel_Files-National_Tables (Estimating 22,498 MDMA-related emergency room visits in 2011, 21,836 in 2010 and 22,847 in 2009).

majority of cocaine-related visits occurred among those who were 25 years of age and older.²³³

Compared to users of other drugs, however, MDMA users present to the emergency room *much* less frequently.²³⁴ The Commission itself noted that “emergency room admission and deaths attributed to use of [MDMA] continue to be less frequent than with other drugs of abuse.”²³⁵ In fact, MDMA-related emergency room visits comprise only 1.9% of drug-related emergency room visits.²³⁶ Cocaine-related emergency room visits, on the other hand, were much more frequent than MDMA-related emergency room visits.²³⁷ In people twenty-one years of age or older, cocaine-related visits comprised 210.7 visits per 100,000 population, as opposed to MDMA-related visits which comprised only 4.7 visits per 100,000 people.²³⁸ In people who were twenty years of age or younger, cocaine-related ER visits comprised 23.8 visits per 100,000 people as opposed to MDMA-related visits which comprised only 12.9 visits per 100,000 people.²³⁹ Even heroin-related visits surpassed MDMA-related visits, with 93 visits per 100,000 people who were twenty-one years of age or older and 21.2 visits per 100,000 people twenty years of age or younger.²⁴⁰ MDMA-related emergency room visits also occur much less frequently than emergency room visits related to alcohol, amphetamines, marijuana and PCP.²⁴¹ In conclusion, emergency-room related data, while supporting the Commission’s concerns, does not support the Commission’s treatment of MDMA relative to other illicit drugs.

3. Drug Trafficking Patterns

The Commission, through its report, expressed concern about the increase of illegal MDMA trafficking and importation by both individuals and drug trafficking organizations.²⁴² The Commission also shared the DEA’s concerns about future increases in MDMA trafficking due to MDMA’s “easy manufacture, relatively benign reputation, and huge

233. DAWN, *supra* note 230, at 34, tbl. 6 (12–24 year-olds comprised 72.3% of MDMA-related emergency room visits while 86% of cocaine-related emergency room visits involved patients who were 25 years of age or older).

234. *Id.* at 34, tbl. 6.

235. GUIDELINE AMENDMENTS, *supra* note 48, at 11.

236. DAWN, *supra* note 230, at 4, fig.1.

237. *Id.*

238. *Id.*

239. *Id.*

240. *Id.*

241. *Id.* PCP, or phencyclidine, is an illegal drug that can cause illusions, auditory hallucinations, “feelings of strength, anxiety, aggression, . . . hostility, . . . delusions, paranoia, and catatonia.” NAT’L DRUG INTEL. CTR., INTEL. BULLETIN: PCP: INCREASING AVAILABILITY AND ABUSE (2004), available at <http://www.justice.gov/archive/ndic/pubs8/8180/>.

242. GUIDELINE AMENDMENTS, *supra* note 48, at 12.

markup,” noting that “the MDMA business has even proved irresistible to many not otherwise involved in drugs.”²⁴³ Although MDMA trafficking declined immediately after the 2001 MDMA guidelines were established, there was a significant increase in MDMA trafficking from 2007 through 2010. Data from 2007 through 2010 “shows high levels of MDMA seizures” in the United States, with more than 15.1 million MDMA dosage units seized.²⁴⁴ “The amount of MDMA seized along the Northern Border increased overall from more than 1.9 million tablets in FY2006 to more than 3.9 million tablets in FY2010, the greatest amount seized in the past 5 years.”²⁴⁵ Further, “the average load size of these seizures” was continuing to increase.²⁴⁶ Data in 2011 also revealed an increase in trafficking activity in the Southwest Border region, where MDMA seizures almost tripled from 2009, when 547,707 tablets were seized, to 2010, when 1,545,607 tablets were seized.²⁴⁷

Recently, however, MDMA trafficking has sharply declined. The DEA reported that only 173,749 dosage units and 390 kilograms of MDMA were seized in 2012, which was “significantly less than the approximately 1.9 million dosage units and 675 kilograms seized in 2011.”²⁴⁸ In its 2013 National Drug Threat Assessment report, the DEA summarized its findings by concluding that “surveys, seizure and treatment data suggest availability and abuse of [MDMA] may have peaked.”²⁴⁹ This recent data indicates that the Commission’s concerns about future increases in MDMA trafficking, although valid in 2000, are no longer supported by data about MDMA trafficking and availability.

Production of MDMA within the United States has increased over the past decade. The 2011 National Drug Threat Assessment stated that the rise of Asian and Mexican criminal organizations have resulted in high levels of MDMA production and availability in the United States.²⁵⁰ Despite a rise in MDMA production, however, there are still a relatively “small amount” of MDMA laboratories in the United States.²⁵¹ 2013 data indicating a low level of MDMA availability throughout the United States

243. *Id.* at 12–13.

244. NAT’L DRUG ASSESSMENT 2011, *supra* note 221, at 30.

245. *Id.*

246. *Id.*

247. *Id.* at 31.

248. NAT’L DRUG ASSESSMENT 2013, *supra* note 228, at 17. A National Drug Threat Assessment was not created in 2012, due to the closure of the National Drug Intelligence Center in June of 2012. The DEA began creating the yearly National Drug Threat Assessment in 2013. *Id.* at iii.

249. *Id.*

250. *Id.*

251. *3,4-Methylenedioxymethamphetamine*, DRUG ENFORCEMENT ADMIN., DRUG & CHEMICAL EVALUATION SECTION (Apr. 2013) http://www.dea/diversion.usdoj.gov/drug_chem_info/mdma.pdf.

supports the conclusion that MDMA production within the United States remains small.²⁵²

Just as the recent decrease in MDMA trafficking calls into question the validity of the Commission's concerns about MDMA drug trafficking patterns, the Commission's treatment of MDMA relative to cocaine is also unjustified. Even before the sharp decrease in MDMA trafficking, MDMA trafficking made up a much smaller percentage of trafficking than other drugs, "including cannabis, cocaine, methamphetamine, and heroin."²⁵³ Further, MDMA trafficking is not associated with violence, unlike cocaine trafficking, which primarily occurs through Hispanic gangs who largely control the market through intimidation and force.²⁵⁴

C. Federal Court Split

Problems with the basis for the Commission's decision to enact a 500:1 MDMA drug equivalency ratio have not gone unnoticed. Recently, defendants across the country have been challenging the MDMA guidelines. Since 2011, several federal district courts have wrestled with the problem, resulting in a disagreement among the courts about how to properly handle the issue. Some federal district courts have deviated from the Guidelines' MDMA ratio on the grounds that the 500:1 ratio is empirically unsupported; these courts have elected to apply substantially lower MDMA drug equivalency ratios.²⁵⁵ Other federal district courts, however, have declined to reject the Guidelines' ratio due to sentencing uniformity concerns as well as concerns about the amount of judicial resources required to properly review all of the relevant scientific data.²⁵⁶ Federal appellate courts have not overturned decisions to deviate from or decisions to adhere to the Guidelines ratio. Because of the deference given to sentencing judges in the appellate review process, the federal district court split will likely remain until the Commission reevaluates the current MDMA ratio.

1. Deviation from the 500:1 MDMA Drug Equivalency Ratio

The United States District Court for the Southern District of New York was the first of the federal district courts to grapple with the issue of whether the 500:1 MDMA drug equivalency ratio would result in "a sentence that is greater than necessary to serve the objectives of

252. NAT'L DRUG ASSESSMENT 2013, *supra* note 228, at 17.

253. NAT'L DRUG INTEL. CTR., NAT'L DRUG THREAT ASSESSMENT 2010, 31 (2010), available at <http://www.justice.gov/archive/ndic/pubs38/38661/38661p.pdf>.

254. *Id.* at 12–13.

255. See *United States v. McCarthy*, No. 09-CR-1136, 2011 WL 1991146 at *1 (S.D.N.Y. May 19, 2011); *United States v. Qayyem*, No. 10-CR-19, 2012 WL 92287 at *1 (S.D.N.Y. Jan. 11, 2012).

256. See, e.g., *United States v. Kamper*, 860 F. Supp. 2d 596, 603 (E.D. Tenn. 2012).

sentencing.”²⁵⁷ In *United States v. McCarthy*, the court held an extensive evidentiary hearing in which it heard expert testimony from four expert witnesses regarding the soundness and validity of the empirical studies on which the MDMA drug equivalency ratio was based.²⁵⁸ The court determined that some of the Commission’s findings were valid. For example, the court stated that recent scientific research had not compromised the Commission’s findings about MDMA’s neurotoxicity to the extent that they were undoubtedly false.²⁵⁹ The court also found the Commission’s findings “that MDMA is uniquely marketed to—and prevalent within—the younger population” to be valid.²⁶⁰

The court was not, however, persuaded as to the validity of all of the Commission’s findings. The court also noted that the Commission incorrectly characterized MDMA as a hallucinogen,²⁶¹ and took issue with the Commission’s comparison of MDMA to cocaine.²⁶² The court specifically mentioned the fact that: (1) there are far more cocaine-related emergency room visits than there are MDMA-related emergency room visits; (2) cocaine use causes health risks not caused by MDMA use, such as “cardiovascular effects, including disturbances in heart rhythm and heart attacks; respiratory effects, such as chest pain and respiratory failure; and neurological effects, including strokes and seizures”; and (3) cocaine trafficking, unlike MDMA trafficking, is connected with “substantial violence.”²⁶³ The court concluded that the Commission’s comparison of the relative impacts of MDMA and cocaine was “selective and incomplete”: “For example, instead of comparing the full range of the health effects of MDMA and cocaine, the Commission focused only on a single health effect: neurotoxicity. In doing so, the Commission ignored several effects of cocaine that render it significantly more harmful than MDMA.”²⁶⁴

The court further stated that the Commission’s flawed comparison of MDMA to cocaine rendered the Guidelines’ MDMA penalties “incompatible with the goal of uniform sentencing based on empirical data.”²⁶⁵ Specifically, the Court felt that when “disparate drug equivalencies are established for similar narcotics based on an incomplete analysis,” the fundamental “need to avoid unwarranted sentence disparities among defendants with similar records who have been found guilty of similar conduct” is “violated.”²⁶⁶

257. *McCarthy*, No. 09-CR-1136, 2011 WL 1991146 at *1.

258. *Id.*

259. *Id.* at *2.

260. *Id.*

261. *Id.* at *3.

262. *Id.*

263. *Id.* at *3–*4 (citations omitted).

264. *Id.* at *3

265. *Id.* at *3–*4.

266. *Id.* at *4 (citing 18 U.S.C. § 3553).

Although the court disagreed with the Commission's MDMA penalties, it also rejected the defendant's request of either a 1:1 ratio or the "pre-2001 ratio of 35:1," deferring "to the Commission's determination . . . that the pre-2001 MDMA Guidelines were too low."²⁶⁷ The court noted that, although there are several ways in which MDMA is less harmful than cocaine, there are also unique dangers associated with MDMA use.²⁶⁸ Ultimately, the court chose to adopt a 200:1 marijuana-to-MDMA drug equivalency ratio, "equal to that of cocaine."²⁶⁹

Less than seven months later, in *United States v. Qayyem*, another district court judge in the Southern District of New York declined to apply the 500:1 MDMA drug equivalency ratio.²⁷⁰ The court reviewed anew the current scientific research about MDMA but also stated that it "relie[d] heavily upon the evidentiary findings set forth in *McCarthy*."²⁷¹ The court expressed many of the same concerns about the Commission's comparison of MDMA and cocaine expressed by the *McCarthy* court, such as the Commission's failure "to compare MDMA to cocaine using the same five-factor rubric" it used in its comparison of MDMA and heroin, the lesser violence associated with MDMA trafficking as opposed to cocaine trafficking, and the Commission's faulty categorization of MDMA as a hallucinogen.²⁷² In addition to these concerns, the *Qayyem* court emphasized that MDMA was not nearly as addictive as cocaine, citing to a study that found that "MDMA consistently ranked in the bottom quartile of all three major categories of harm."²⁷³ These categories included "(1) physical harm to the individual user; (2) the tendency of the drug to induce physical and psychological dependence; and (3) social harm, defined as the effect of drug use on families, communities, and society."²⁷⁴

Although the court disagreed with much of the Commission's analysis, the court did agree with the Commission's concerns about "[MDMA's] potential neurotoxicity, coupled with its popularity among youth."²⁷⁵ Ultimately, however, the court concluded that the 500:1 ratio "chosen by the Commission does not accurately reflect the then-existing research, nor is it supported by more recent evidence."²⁷⁶ The court declined to apply the 100:1 drug equivalency ratio requested by the defendant in this case, but, on the grounds that the 500:1 ratio was "greater

267. *Id.*

268. *Id.*

269. *Id.*

270. No. 10-CR-19, 2012 WL 92287 at *1 (S.D.N.Y. Jan. 11, 2012).

271. *Id.* at *2.

272. *Id.* at *3–*4.

273. *Id.* at *4 (citing *United States v. McCarthy*, No. 09-CR-1136, 2011 WL 1991146 at *2 and D. Nutt et al., *Development of a Rational Scale to Assess the Harm of Drugs of Potential Misuse*, 369 LANCET 1047 (2007)).

274. *Id.* (citing Nutt et. al, *supra* note 273, at 1047).

275. *Id.* at *5.

276. *Id.*

than necessary to serve the objectives of sentencing,” the *Qayyem* court, like the *McCarthy* court, adopted a 200:1 MDMA drug equivalency ratio instead.²⁷⁷

2. Adherence to the 500:1 MDMA Drug Equivalency Ratio

Not all courts have agreed with the decision to adopt a 200:1 marijuana-to-MDMA drug equivalency ratio, however. In *United States v. Kamper*, the United States District Court for the Eastern District of Tennessee upheld the current 500:1 marijuana-to-MDMA ratio, rejecting the defendant’s request to reduce the ratio.²⁷⁸ The Court declined the chance to “categorically reject” and replace the MDMA drug equivalency ratio, reasoning that the Commission, not the court, is in the best position to make this decision.²⁷⁹ The court emphasized that the Sentencing Commission is in a better position to determine an appropriate drug equivalency ratio for MDMA, because the determination necessarily involves the review and consideration of extensive scientific data, value judgments about the relative harm of MDMA, and national public policy issues.²⁸⁰ The court explained that “an individual federal district court judge simply cannot marshal resources akin to those available to the Commission for tackling the manifold issues involved with determining a proper drug equivalency.”²⁸¹

The court in *Kamper* also expressed great concern about the inherent administrative problems with a “reject-and-replace approach”—the exact approach for which the defendant in this case argues:

Federal law provides for 667 district court judgeships. Under [the defendant’s] approach, every single one of these judges could reject the MDMA-to-marijuana ratio under the Guidelines and replace that ratio. . . . This approach would almost certainly produce the kind of unwarranted sentencing disparities § 3553 attempts to avoid.

A sentence for an MDMA defendant would be based not on the facts and laws of each case, but on the ratio employed by the particular sentencing judge, where even different judges in the same courthouse could rely on different

277. *Id.* at *1.

278. 860 F. Supp.2d 596, 603 (E.D. Tenn. 2012).

279. *Id.* at 607.

280. *Id.* at 606–07.

281. *Id.* at 607.

ratios. In the face of such a haphazard process, the public would rightfully lose respect for the courts.²⁸²

Finally, the court also expressed concerns with regard to proper separation of powers.²⁸³ The court believed that the defendant, by requesting that the court abandon the 500:1 MDMA drug equivalency ratio, was “in essence ask[ing] the Court to step into the shoes of Congress and the Commission and legislate a change to the drug equivalency table under the Guidelines.”²⁸⁴ Noting that the decision in *Kimbrough* “did not alter this fundamental structural principle” of separation of powers, the court expressed its unwillingness to deviate from the Guidelines and create a new MDMA drug equivalency ratio.²⁸⁵

Just two weeks after *Kamper*, a federal district court judge in the Southern District of Illinois similarly declined to deviate from the Commission’s 500:1 MDMA drug equivalency ratio.²⁸⁶ The judge admitted that there is “considerable uncertainty . . . as to the science and policies underlying the marijuana-to-MDMA ratio,”²⁸⁷ but he deferred to the Commission’s ratio anyway, simply stating that the defendant’s “arguments that the current MDMA Guideline/ratio is unworthy of application-across-the-board or in this particular case” were unpersuasive.²⁸⁸ His decision to defer to the Commission in this instance appears to be based, in part, on the fact that he “has considerably less experience with MDMA cases than cocaine cases.”²⁸⁹ The judge believed this to be relevant “in that [a] Judge may defer more to the Commission in less familiar territory.”²⁹⁰ The Court also emphasized that, although it would be permitted to “delve into the history of a guideline or review and assess the deliberative process of the Commission in establishing that guideline in order to properly sentence a defendant,” it was not required to do so.²⁹¹

Despite the Court’s adherence to the 500:1 MDMA ratio, however, the court declared that, “[a]t some point in the future, there may be an appropriate case in which to consider afresh whether deviation from the MDMA Guidelines is merited based on new development, research, or caselaw.”²⁹²

282. *Id.* at 605.

283. *Id.* at 604.

284. *Id.*

285. *Id.*

286. *United States v. Thompson*, No. 10-CR-30168-01, 2012 WL 1884661 at *5 (S.D. Ill. May 23, 2012).

287. *Id.* at *5 (citing *Kamper*, 860 F. Supp.2d at 610).

288. *Id.*

289. *Id.*

290. *Id.*

291. *Id.* (citing *United States v. Aguilar-Huerta*, 576 F.3d 365, 367–68 (7th Cir. 2009)).

292. *Id.* at *5.

In June of 2012, the Federal District Court of the Western District of Michigan declined to reduce a defendant's sentence by recalculating the sentencing using the 200:1 marijuana-to-MDMA ratio adopted by the *McCarthy* court.²⁹³ The court reasoned that the discovery of new scientific data merely creates an *argument* that the court should deviate from the Commission's guidelines, which does not raise an issue of "constitutional magnitude," nor does it "render the entire proceedings invalid."²⁹⁴ In late 2012, *United States v. Thannavong*, a federal district court in the Middle District of Tennessee followed in the footsteps of the *Kamper* court, also upholding the current 500:1 marijuana-to-MDMA ratio.²⁹⁵ The district court in *Thannavong* based its decision, however, on "the large extent of the drug conspiracy, the national scope, the amount of money, and the large quantity of marijuana" involved.²⁹⁶

3. Adherence/Deviation: An Abuse of Discretion?

To date, the Sixth Circuit,²⁹⁷ Seventh Circuit,²⁹⁸ and Tenth Circuit²⁹⁹ have reviewed the application of the 500:1 marijuana-to-MDMA ratio, and all three courts held that the application of the 500:1 ratio is not unreasonable. In *United States v. Ferguson*, the Defendant appealed his sentence, arguing, "[T]he District Court's application of the 1:500 ratio was unreasonable in light of empirical data suggesting that the ratio is unduly harsh and otherwise lacks justification."³⁰⁰ The Tenth Circuit, reviewing for abuse of discretion, upheld the district court's decision to apply the 500:1 MDMA drug equivalency ratio.³⁰¹ The court stated a sentencing judge has discretion to deviate from the "advisory conversions" of the Guidelines when he or she "disagrees with the policy or harshness" of the advisory

293. *Hughes v. United States*, 1:11-CV-1028, 2012 WL 1981715 at *1, *3 (W.D. Mich. June 1, 2012).

294. *Id.* at *1-*2 (citing *Humphress v. United States*, 398 F.3d 855, 858 (6th Cir. 2005)). The court also denied the defendant's motion, which was based on 28 U.S.C. § 2255, because the defendant had not filed his motion within the one-year statute of limitations and because, "[w]hen the claimed error is a constitutional error, § 2255 affords relief only when the error has a 'substantial and injurious effect or influence' on the proceedings." *Id.*

295. 533 F. App'x 589, 592 (6th Cir. 2013), *cert. denied* No. 13-7438, 2014 WL 102832 (2014).

296. *Id.* at 593. Specifically, during the sentencing hearing, the district court judge said, "It wasn't just Ecstasy, it was marijuana. It wasn't just one transaction, there were many. It was national, interstate, in structure, in transactions, lots of money, weapons. And to me, that's a different set of dangers separate and apart from just the fact that Ecstasy is involved and the Commission thinks it's 500. For purposes of sentencing here, it's the facts of the offense and the commercial aspects of the offense that, to me, take it outside the scope of this policy differences on health effects of health dangers of Ecstasy." *Id.* (emphasis added).

297. *Thannavong*, 533 F. App'x at 592; *Kamper*, 860 F. Supp.2d at 610.

298. *United States v. Scott*, 527 F. App'x 539 (7th Cir. 2013).

299. *United States v. Ferguson*, 447 F. App'x 898, 902 (10th Cir. 2012).

300. *Id.* at 902-03.

301. *Id.*

penalty.³⁰² The court nevertheless emphasized that the fact that judges are permitted to deviate from the Guidelines does not make it “an abuse of discretion for a judge to adhere to the equivalency table, policy critiques notwithstanding.”³⁰³ The Tenth Circuit, however, made no commentary about the appropriateness of the MDMA drug equivalency ratio itself.³⁰⁴

In *United States v. Thannavong*, the Sixth Circuit also upheld the district court’s decision to apply the 500:1 MDMA ratio.³⁰⁵ In its opinion, the court highlighted “the fact that a district judge *may* disagree with a guideline for policy reasons and *may* reject the Guidelines range because of that disagreement does not mean the court *must* reject the Guidelines range if it disagrees.”³⁰⁶ The Sixth Circuit, however, conceded that, “in an appropriate case,” the 500:1 MDMA-to-marijuana ratio may “overstate[] the nature of the offense and the need for the sentence imposed.”³⁰⁷ Finally, the Seventh Circuit upheld an application of the 500:1 ratio where the district court failed to address the defendant’s argument that the ratio was inappropriate.³⁰⁸ The court stated that the district court was not obligated “to answer the abstract policy argument that the ratio defined in the Drug Equivalency Table is unworthy of application in *any* case”³⁰⁹

Because abuse of discretion is the standard of review for sentencing decisions, it is highly unlikely that any federal appellate court will overturn a lower court’s application of the Commission’s current MDMA drug equivalency ratio. Even if an appellate court expressed doubt about the validity of the Commission’s basis for the ratio, such commentary would be mere dicta and would not have any binding effect on the lower courts. It is, therefore, highly unlikely that arguments to the federal appellate courts will result in a solution to the current problem with the MDMA guidelines.

IV. A CALL FOR REEVALUATION

The many errors made by the Commission in formulating the current MDMA drug equivalency ratio render the current ratio questionable at best. The unresolved federal district court split, as previously detailed in Part III, threatens horizontal sentencing uniformity. Further, considerable judicial resources have already been used to analyze scientific research and expert testimony in an attempt to draw a proper conclusion about the harms

302. *Id.*

303. *Id.*

304. *Id.*

305. 533 F. App’x 589, 593 (6th Cir. 2013).

306. *Id.* (quoting *United States v. Brooks*, 628 F.3d 791, 800 (6th Cir. 2011) (emphasis in original)).

307. *Id.* The Court also noted that the “[a]ppellant bears a heavy burden in seeking reversal of a district court’s decision to reject a categorical attack on the sentencing formula promulgated by the Sentencing Commission.” *Id.*

308. *United States v. Scott*, 527 F. App’x 539, 541 (7th Cir. 2013).

309. *Id.* (citations omitted).

of MDMA use and trafficking. The erroneous foundation of the current MDMA penalties, combined with the federal district court split and the need for judicial efficiency, mandate a prompt reevaluation of the current MDMA drug equivalency ratio by the Commission.

In light of the new knowledge about the physiological harms that can be gleaned from modern science, as well as the disagreement among district courts, the U.S. Sentencing Commission should promptly reevaluate the current MDMA drug equivalency ratio.³¹⁰ Without reevaluation, the future inevitably will consist of the use of an inordinate amount of judicial resources spent on determining proper equivalency ratios, an ever-increasing amount of appeals of MDMA-related sentencing decisions, and increasing instances of sentencing disparity among defendants.

A reexamination of the MDMA Guidelines would not necessarily have to—but, based on current data, likely should—lead to a reduction of the MDMA penalties. The importance of a well-founded, well-reasoned drug equivalency ratio far outweighs the importance of the actual outcome of the reevaluation itself. A reexamination of the MDMA Guidelines will require the Commission to perform a new analysis of the scientific research about the physical harms of MDMA and a new analysis of the social policies and rationale behind MDMA penalties. Ideally, the Commission should not start from its 2001 decision, but rather should start fresh and focus solely on the most credible data available. The Commission should perform a *complete* analysis of how the harms of MDMA compare to the harms of other drugs such as cocaine, heroin, marijuana, etc.

The Commission must reexamine the MDMA drug equivalency ratio because there are no other satisfactory alternative remedies. The current district court split will only grow. Courts do not have the resources of the Commission to develop empirically-supported Guidelines, because extensive fact-finding and specialized expertise is required to make informed decisions about drug equivalency ratios. Courts may end up using an inordinate amount of judicial resources to develop Guidelines, which is an extraordinarily inefficient use of judicial resources. If courts do not use adequate resources when implementing their own MDMA ratio, however, there is a large risk that the courts will apply disproportionate ratios. Alternatively, courts that decline to implement a new ratio because of the administrative problems will continue to implement sentences that are greater than necessary to adequately protect the public, serve as an effective deterrent, and provide sufficient retribution.³¹¹ Not only is this fundamentally unfair, but it flies in the face of the statutory sentencing policies set forth in § 3553(a).

310. There is also an apparent need for further scientific studies about and evaluation of the effects of MDMA. Further studies should specifically control for extraneous variables such as simultaneous polydrug use, adulterated MDMA tablets, and extensive prior abuse of illicit substances.

311. See U.S.C. 18 § 3553(a) (2012).

Blatant problems with the crack-cocaine Guidelines remained in place for twenty years, because Congress (and, for quite some time, the Commission) refused to act to solve the problem. The implementation of fundamentally unfair crack cocaine sentences for two decades led to “one of the greatest stains on our federal criminal justice system.”³¹² The current MDMA Guidelines have been in place for over twelve years. It is time. Both the Commission³¹³ and Congress have the authority to reexamine the MDMA Guidelines, and yet neither body has given any indication that it intends to tackle the problem. In order to avoid repeating its past mistakes, it is imperative that the Commission promptly reevaluate the current MDMA sentencing policies.

312. Cratty, *supra* note 4.

313. The Commission has an ongoing responsibility to review and refine the Guidelines.

