

# 1. Publishing Software as a Speech Act

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## Abstract

We often talk as though the First Amendment protects things that communicate, like books or pictures. Unsurprisingly, we have trouble deciding whether computer software is “speech”—to non-programmers, it seems more like a tool to be used than a book to be read. I argue that the question isn’t whether something is speech, but whether someone is speaking. First Amendment analysis should focus on speech acts, not on the things we use in those acts. Studying heads won’t tell you whether head-shaking means “no”; the answer lies in our communicative conventions. Some such conventions are widespread, like natural languages; others are specialized, like those of art and science worlds. On this approach, publishing source code generally is a speech act because computer scientists and programmers conventionally intend to communicate ideas about computational procedures by publishing source code. Accordingly, government restrictions on source code publication trigger First Amendment scrutiny.

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### 1. Introduction

Computer programs are fun to write, and well-written computer programs are fun to read. One of life’s greatest pleasures can be the composition of a computer program that you know will be a pleasure for other people to read, and for yourself to read. . . . At first, I thought programming was primarily analogous to musical composition—to the creation of intricate patterns, which are meant to be performed. But lately I have come to realize that a far better analogy is available: Programming is best regarded as the process of creating *works of literature*, which are meant to be read.<sup>1</sup>

Daniel J. Bernstein, a math professor, wrote a computer program in source code form<sup>2</sup> as part of his research and wants other professors and programmers, including foreign persons, to read, study and criticize it. If the government won’t let him publish<sup>3</sup> without a license, does he have a First Amendment claim? This fact situation was the heart of *Bernstein v. United States Department of Justice*,<sup>4</sup> a case<sup>5</sup> challenging the constitutionality of export controls on the dissemination of encryption source code<sup>6</sup> as a violation of the First Amendment’s standards for pre-publication licensing schemes.<sup>7</sup> Indeed, Professor Bernstein in part intended the creation and publication of his source code as political criticism of the encryption export regulations.<sup>8</sup>

In most First Amendment cases, someone’s right to speak is obviously at stake, and the question is whether the government meets its burden under the appropriate test. But in Bernstein’s case, the government claims that “speech” isn’t at issue, and the question is whether the First

Amendment even “is brought into play.”<sup>9</sup> The former cases present questions of protection; the latter, of coverage.<sup>10</sup> And we usually ask coverage questions in the form, is that “speech”?

Is software “speech”? It should be obvious that it is. A computer program states or represents a procedure or algorithm in a programming language.<sup>11</sup> The same algorithm could be written in a natural language like English or a programming language like C or LISP, but it remains the same algorithm. For years, computer scientists and programmers have published both algorithms and source code in computer science books and textbooks, academic journals, and popular computing magazines.<sup>12</sup> And computer scientists and programmers read source code just as economists and mathematicians read equations in their fields.<sup>13</sup> To publish source code is therefore to perform a linguistic act that has meaning to computer scientists and programmers. Indeed, one would think that publishing source code fits perfectly within the general category of “scientific speech”<sup>14</sup> and, for Bernstein, within “academic freedom.”<sup>15</sup>

My general point is that if we’re trying to decide whether the First Amendment covers Bernstein’s publishing his software, the query “is software speech?” is the wrong question. It’s an ontological category-mistake, like trying to decide whether a plaster sculpture is covered by the First Amendment by asking, “are plaster objects speech?”<sup>16</sup> or whether parades are covered by asking, “is walking speech?”<sup>17</sup> These questions view speech as a work, a thing, and they lead us to ask if that thing qualifies as speech: does it have meaning, or is it functional? But things without meaning can be used communicatively. Walking is often quite functional—it gets you from here to there. Walking with a certain intent, however, is parading, and in that case the walker is speaking.

Thus, we should instead ask, “is Bernstein speaking?” This latter question focuses on the putative speaker’s act as an act, and thus his intent. If a programmer publishes software in order to communicate its meaning or propositional content to others, then the programmer’s act is done with the illocutionary force of asserting that meaning—and he is performing a speech act.<sup>18</sup> It’s not irrelevant that software has meaning. But what really matters for First Amendment analysis isn’t merely the meaning of the software, but the illocutionary force of the putative speaker’s act.

Furthermore, without recognizing the variable of illocutionary force, we run the risk of miscategorizing speech acts as perlocutionary acts—acts intended to cause a certain effect. Because people often think of software mainly in terms of its effects, they may think that one who publishes software intends to cause effects. But our speech acts often have effects. A museum that displays nude sculptures and paintings may offend people. Without more, however, we would not characterize the museum as intending to offend anyone.

I contend that the First Amendment covers speech acts, and the nature of a thing has no logical bearing on whether what one does with it is a speech act. The crucial issue as to whether an act is

a speech act is the speaker's intent in relation to social practices or conventions.<sup>19</sup> For First Amendment purposes, "social conventions" refers not only to practices of the community as a whole, but also to those of subcommunities, particularly "speech subcommunities" like art, music, and scientific worlds.<sup>20</sup> Thus, I'm mainly concerned with First Amendment coverage as a methodological issue, and I'll use software as the vehicle for my argument. Moreover, for the remainder of this piece I will make use of a hypothetical programmer, Alice, so that we may focus on the methodological issue without being distracted by the particularized facts of the *Bernstein* case.

Accordingly, the software cases raise two main issues for First Amendment analysis. The coverage question asks whether "uttering" software is a speech act. Alice's case is a clear instance of seeking to publish software for expository purposes. Thus, when Alice publishes source code, intending it to be read by members of the scientific community, such that by the community's conventions it is publishing, she performs the speech act of scientific publishing—which is covered by the First Amendment.

Second, to the extent that the Court speaks of speech in terms of acts, it focuses on speech acts as propositional acts or perlocutionary acts, but not as illocutionary acts. In so doing, the Court leads us to think of speaker's intent in relation to meaning or effects, but not in relation to illocutionary force. Although protection isn't my main concern, my argument implies that it should be analyzed using the general conceptual apparatus for evaluating acts.<sup>21</sup> The issues raised by software publication are like those raised by conspiracy or aiding and abetting.<sup>22</sup> There's no doubt that the actor is speaking, but he might "also" or "really" be doing something else. The issue therefore becomes how the law should treat behavior that can be viewed as both a speech and a non-speech act. To answer this question, then, we must identify the conditions for coverage of speech acts rather than speech works, and distinguish issues of coverage from issues of protection. Crucially, Alice's act of publishing her software in itself causes no harm. The fear is that others may use her software to cause harm. The risk of harm is difficult to distinguish from that associated with the publication of many kinds of information.

In short, there's nothing special about software for purposes of First Amendment coverage. The First Amendment need not be "extended" for software to be covered as "speech." The debate over software publication merely forces us to face the logical defects associated with thinking of the First Amendment in terms of speech rather than speaking. Speech doesn't "do" or "say" anything; people do. And hearers did things with what speakers said long before there were computers or software.

## 1. The First Amendment covers Speech Acts

Whether something is "speech" matters to First Amendment jurisprudence because we believe we

must justify special protection for speech. There have been many attempts to justify First Amendment coverage in terms of a free speech principle.<sup>23</sup> Our “standard list of candidates” derives from the various theories of free speech: the pursuit of truth, self-governance, the “checking value” of free speech, and so on.<sup>24</sup> But there seems to be no discernible general principle here, for these various theories don’t cohere particularly well.<sup>25</sup> And the most general candidate for a free speech principle—individual self-realization—doesn’t seem to distinguish speaking from other human activity. The Court, however, hasn’t seemed to need such a theory to decide coverage issues. While many consider the Court’s coverage doctrine to be incoherent, it can be harmonized without appealing to a grand theoretical framework of First Amendment values.

We know that the First Amendment protects “the freedom of speech.”<sup>26</sup> I suggest that we need not appeal to any deep-seated concept of First Amendment values in order to decide coverage questions. Instead, coverage issues primarily raise practical problems about whether someone is speaking.<sup>27</sup> First, we have some general theoretical principles about communication, and publishing source code fits those principles. Second, those principles can’t resolve coverage questions by themselves. The coverage of the First Amendment has changed and will change over time. The most we can hope for is a principled set of meta-criteria to use in deciding coverage issues, which can be found in our speech practices. In short, for coverage purposes we don’t need a better theory of why we protect speech; we need a better theory of speaking.

Speech act theory provides us with such meta-criteria. Under this theory, the critical question for coverage purposes is whether the act at issue is an act of communication,<sup>28</sup> and speech act theory assists in the analysis by formalizing the notion of communication in terms of meaning, intent, and conventions. For an utterance to qualify as a *speech act*, the speaker must intend to produce understanding in the hearer by resort to or in virtue of the social context, or conventional meaning, of what the speaker says.<sup>29</sup> Both the intent and social context aspects are necessary to transform an utterance into a speech act. Thus, this definition roughly excludes acts for which the speaker does not intend to produce understanding, or for which the meaning arises without reference to conventions.

In this Part, I begin by defining the basic concepts of speech act theory, and relate them back to the act of publishing software. Once these concepts of speech act theory are established, I apply them to reframe and explain the *Spence* Court’s “expressive conduct” test, which establishes the boundary between conduct that communicates, and unprotected, uncommunicative acts, in First Amendment jurisprudence.

## 1. Definition of Speech Acts

Anything can, in principle, be “speech.” That an object is made of metal, uses electricity, or

whatever, does not disqualify it from being “speech”; any thing can be “speech” in the right circumstances because we might have a practice of using the thing that way.<sup>30</sup> Rather, coverage under the First Amendment is a merely a function of intent to communicate.<sup>31</sup> But the intention that matters isn’t merely the speaker’s or the hearer’s, or even both. It is a complex function that includes “social context.”<sup>32</sup> Two key components of social context are relevant to intention in coverage analysis: conventional social practices like language, and specific practices of what I call speech subcommunities, like art, music, and science worlds.

I argue that we must analyze coverage issues by looking at the “total speech act in the total situation.”<sup>33</sup> This approach permits us to make all the distinctions we need to understand how Alice’s act of publishing her software can be covered by the First Amendment even though other acts done with software might not be, the same way that not every act performed with respect to a flag is covered.<sup>34</sup> Or, to formalize this analysis within speech act terminology I claim that the First Amendment covers illocutionary acts,<sup>35</sup> which are acts that conform to certain community conventions.<sup>36</sup> To perform an illocutionary act, the speaker must intend to communicate the propositional content<sup>37</sup> of his utterance act,<sup>38</sup> and this content must be communicated in a way that conforms to the language conventions of the community to which the speaker addresses the speech act.<sup>39</sup> Borrowing heavily from philosophers Austin and Searle,<sup>40</sup> in this Part I will set out the basic definition of a speech act, which includes an utterance and propositional act, intent to communicate, and a relevant speech community or convention within which the communication occurs.

## 1. ***Utterance Acts and Propositional Meaning***

A physical utterance act is the first and most basic component of a speech act. It consists of the physical components of speech: producing sounds, marks on a page, or marching in a parade.<sup>41</sup> Alice performs an utterance act by typing her source code into a computer, or uploading it onto the Internet. But what we utter or say, according to Austin, are not necessarily themselves speech acts. A sentence “is *used in making a statement*, and the statement itself is a ‘logical construction’ out of the makings of statements.”<sup>42</sup> Thus, without more, an utterance act does not necessarily become a speech act—but a speech act necessarily includes an utterance act.

Searle, in turn, refined and extended Austin’s insights regarding speech acts; neither words nor sentences express propositions, he argued, but rather “in the *utterance* of the sentence, the speaker expresses a proposition.”<sup>43</sup> So if the utterance act is to be a speech act, according to Searle, it must also contain some propositional content. That is, the spoken words or physical actions must have some meaning. For example, Alice can write software expressing a certain algorithm or mathematical procedure. The propositional content would consist of that concept. The utterance act, together with its propositional meaning, constitutes a propositional act.<sup>44</sup>

## 1. *Intent and Illocutionary Force*

Given a propositional act, the question becomes, “[h]ow . . . do we get from physics to semantics?”<sup>45</sup> In other words, when does an utterance act with propositional meaning become a speech act? The general answer is that intentions bridge the gap. Searle explained that the speaker’s intent to perform a speech act transforms an utterance act—like making noise—into a speech act.<sup>46</sup> Thus, Alice’s act of uploading her software can only be a speech act if she publishes with the requisite intent.

The intention that makes an act a speech act isn’t simply the speaker’s intent to express an idea *qua O’Brien*,<sup>47</sup> which only corresponds to the propositional act. In *O’Brien*, the defendant burned his draft card to demonstrate his antiwar beliefs.<sup>48</sup> He thus performed an utterance act of burning his draft card, which had antiwar propositional meaning to him. In general, a speaker’s saying something and meaning it is closely connected with intending to produce the hearer’s understanding. Also, understanding an utterance act is closely connected to whether the listener recognizes the speaker’s intention. And because a speech act is always an illocutionary act, the relevant intent includes illocutionary intent. What’s expressed in my saying “Hello” to you isn’t merely that “Hello” is a greeting, but also that I am greeting you.

When I perform the speech act of saying “Hello,” I have some intent, and I’ve been saying that this intent is crucial. But what is that intent? We can imagine situations where my saying “Hello” is not used to greet. I might be a non-native English speaker practicing the pronunciation of a useful word. Or I might be practicing a line in a play. In neither case do I utter “Hello” with the intent to greet anyone.

There’s a double level of “intentionality” to illocutionary acts. One has an attitude or mental state expressed *in* the performance of the act and also an intent *to* perform it. When I say “It’s raining,” an assertive, I express the belief that it is raining and perform the intentional act of asserting that it is raining. When I say “I promise to mow the lawn,” a commissive, I express the intent to mow the lawn and perform the intentional act of promising to mow the lawn. My saying “Hello,” an expressive, is my performing an illocutionary act of greeting. I express an intent in what I say, an intent to greet you. I also perform an intentional act of greeting, I intentionally greet you.

These two intents aren’t the same. I might not sincerely mean what I seem to mean. I might just want to conform to social nicety. But whether I really mean it or not, I intentionally perform the act of asserting a fact, of promising, or of greeting you. Searle labels these double levels of intent the “sincerity condition” and the “meaning intention”—respectively, “the psychological state expressed in the performance of the act” and “the intention with which the act is performed which makes it the act that it is.”<sup>49</sup> Threats are a good example. A threat is a serious expression of intent to cause significant harm. Expressing an intent to cause you harm corresponds to the sincerity

condition, because whether or not I really intend to cause you harm, I express that intent; seriousness of expression corresponds to meaning intention, whether I intend for you to take my words or conduct as a threat.<sup>50</sup>

Meaning intentions, in turn, have two aspects: the intention to represent and the intention to communicate.<sup>51</sup> As with the sincerity condition and meaning intention, these two intentions aren't the same. In the genuine case of saying "It's raining," I intend to represent that it's raining. But I might also want to communicate that I don't want to walk the dog. The representing intention is prior to the communication intention; "[o]ne can intend to represent without intending to communicate, but one cannot intend to communicate without intending to represent."<sup>52</sup>

On this analysis, "[t]he communication intention consists simply in the intention that the hearer should recognize that the act was performed with the representation intention."<sup>53</sup> Thus, when I say "it's raining," I mean what I say if I said "it's raining" with the intention that my utterance have conditions of satisfaction—that it matters to my saying it (which isn't the same as it mattering to me) whether it really is raining. If I'm just practicing saying "it's raining," it's irrelevant whether it's raining.

With regard to the speaker's intent, we should always ask whether it matters to the speaker's statement that the hearer grasp the illocutionary force. I perform an act of asking you to do something only if it matters to my uttering the request that you understand that I am trying to get you to do it. The illocutionary force in this case is the status of the utterance as "asking," as opposed to "informing" or "promising," and my intent is communicated if you have understood that I was asking you a question. This intent is objective, not subjective.<sup>54</sup> It turns on an objective interpretation of the act in light of the circumstances in which it is made.

## 1. ***Social Conventions and Community***

If I issue sounds or make marks, what matters is that I intend the sounds or marks to be a speech act. But this intention must have a certain structure and content. While anything can be used to communicate, what is distinctive about speech acts is that they are conventional, in the sense that language is a set of social conventions. One must intend to use conventions, and intend that the hearer understand in virtue of his or her understanding those conventions. In Alice's case, the conventions that matter are those within her particular community: the world of computer scientists and mathematicians.

Earlier, I focused on meaning and intent. I mostly used examples of linguistic acts, because we presume that actors performing such acts intend to communicate, and because such acts have utterance meaning by virtue of their being in a language. But I've also claimed that anything can be "speech," because anything can be used to communicate. Thus, communication can include

nonlinguistic conduct like flag burning that we presume is intended to communicate and is generally perceived as having utterance meaning. At this point the skeptic may ask, does language matter at all?

Language does matter. The relationship of speech acts to language, however, is not that speech acts must be in a language, but rather that language constitutes a system of conventions that permits speakers to perform otherwise purely physical acts like uttering sounds that hearers understand in virtue of their knowing those conventions. But because language is not the only system of conventions that makes intersubjective utterance meaning possible, nonlinguistic acts can also be speech acts. Symbolic speech is usually conventional in a language-like way. This is easiest to see with objects that have social meaning, like flags. Flying such flags in certain ways expresses something. They are referents that can be used in speech acts. Indeed, we should think of the meaning relevant to coverage issues in terms of “meaning by convention” or “conventional meaning.”<sup>55</sup>

Language is not merely useful; it is a critical part of what makes a community a community. Languages provide sets of conventions, regular ways of expressing and communicating thoughts and ideas shared by a group of speakers.<sup>56</sup> Language is by nature a shared or community phenomenon that separates the idiosyncratic from the public. The First Amendment strengthens communities by protecting speaking to a speaker’s intended audience.<sup>57</sup> A common language makes speech to an audience possible; indeed, one may say that it defines the audience, and vice versa. Speaker and audience, sharing a common language, can speak to one another. To belong to a community is to speak its language, in a strong sense.<sup>58</sup>

It is also crucial to recognize that various subcommunities, such as those in the artistic or scientific world, may have their own, legitimate and particularized language conventions. Just as language, as a system of conventions, is constitutive of community in general, these subcommunities are constituted by their conventions.<sup>59</sup> Accordingly, the conventions and social practices that breathe life into the intent and meaning of speech acts must also include those of subcommunities.<sup>60</sup> Courts should defer to the conventional practices of speech subcommunities in defining speech acts.<sup>61</sup>

We’ve been asking whether Alice performs a speech act by publishing her computer program, or in thing-mode, whether her computer program “is speech,” if not everyone takes it that way. Professor Post argues that social context is a large part of what makes something speech.<sup>62</sup> And one part of social context is our shared conventions. Thus, as Professor Post notes, the artist Marcel Duchamp’s famous readymade sculpture, *The Fountain*, which is simply a urinal, is speech because the shared conventions of the art world, as expressed by the medium of an art exhibit, made it so.<sup>63</sup> In referring to conventions surrounding art exhibitions, shared by artists and spectators, Professor Post implies that the relevant conventions need not be shared by the larger

world of which the art world is a part. The parallel argument for Alice is that the shared conventions of the scientific world, especially the world of computer programming, make her publishing her software a speech act.

Why and how should courts deciding First Amendment cases accept or defer to the art world or any other kind of world? Questioning what “art” is, is intrinsic to the art world in our society, and arguably in any society that recognizes art as a status or label that matters to resource allocation.<sup>64</sup> Like the courts attempting to decide coverage issues, non-artists often ask, “what is art?” or “what makes this work ‘art’?” But those inside the art world ask the same question.<sup>65</sup> An important part of the art world in our society is a questioning, abstract or concrete, of its own activity. Aestheticians and philosophers ask, “what is art?” artists claim that their works are “art” in a way that challenges the critics. Thus, artists and aestheticians engage in a dialogue over what “art” is.<sup>66</sup>

Art worlds provide judges with a more-or-less external and relatively objective criterion for defining what constitutes “art.” As an empirical matter, the aesthetics and practices of a world provide an invaluable source of judgments that courts can use to determine coverage issues. “Art world members characteristically, despite doctrinal and other differences, produce reliable judgments about which artists and works are serious and therefore worthy of attention.”<sup>67</sup> These judgments “stabilize values” and “regularize practice.”<sup>68</sup> As a normative matter, art worlds define art for us, not dispositively but as part of a dialogue between art worlds and the larger society. Artists, critics, aestheticians, gallery owners, and so on, participate in an ongoing dialogue over art and its meaning, not just in discourse but in their everyday activities.<sup>69</sup> Art world judgments help define art for the rest of us. It is of great benefit to the First Amendment, and of little or no harm to it, for the law to consider these judgments as having significant authority.

Finally, deference to art worlds is consistent with the First Amendment metavalue of not freezing definitions in time.<sup>70</sup> Institutional processes in art worlds are a locus of change in our larger understandings of art;<sup>71</sup> by looking to subcommunities that have traditionally been central to speech activities, courts preserve flexibility in this essentially contested area.

If art world conventions can breathe constitutional significance into the “medium” of art exhibitions,<sup>72</sup> conventions within the scientific communities can do the same for software. The “scientific method” and other protocols appurtenant to science correspond to the art world’s aesthetics: Scientists use methodology as a standard paradigm or framework to evaluate scientific work. When an author publishes a work according to that convention, she declares it with the illocutionary force of scientific publication. In other words, the published work becomes imbued with the First Amendment coverage of scientific conventions. Therefore, if a person follows the relevant conventions, the government should bear the burden of showing that the conventional illocutionary forces associated with publication are not present in a particular case.

## 1. Revisiting Expressive Conduct

The boundary between expressive conduct—conduct that communicates—and unprotected, noncommunicative acts presents special difficulties for First Amendment law. The Court’s difficulties stem from two different mistakes. First, it views speaker’s intent as independent of meaning (or force), and vice versa. But language is fundamentally intersubjective, and my appeal to language and language-like community conventions is intended to emphasize that language itself internally connects intent and meaning. Second, to the extent that the Court thinks of speech in terms of acts, it focuses on speech acts as propositional acts or perlocutionary acts, but not as illocutionary acts; if I advocate overthrowing the government, I perform an illocutionary act: advocating a proposition. If I intend to persuade my audience to actually follow through, my act was perlocutionary.<sup>73</sup> The Court accordingly speaks of speaker’s intent in relation to the meaning of what is said (the government should be overthrown) or effects (persuading others to overthrow the government), but not in relation to illocutionary force (asserting that the government should be overthrown). This distinction is unimportant for many speech acts. If I mention that someone insulted you, you ask me what he said, and I quote him, you know that I was not insulting you. You would probably say that I did not mean to insult you even though I said the same words. As linguistically competent speakers, we share communicative conventions like reporting or quoting that enable us to grasp illocutionary force as part and parcel of meaning. But this blurring can be problematic when the conventions are not so widely shared.

The Court’s approach to expressive conduct can be clarified by incorporation of speech act theory. The following analysis addresses the Court’s current doctrinal approach to expressive conduct, and attempts to clarify that approach through application of the principles of speech act theory developed above. Speech act theory provides a more precise and consistent method for determining when particular conduct can be considered an act of communication that should be entitled to the coverage of the First Amendment.

### 1. *The Court’s Stated Approach to Expressive Conduct: The Spence Test*

*Spence v. Washington* presents the archetypal example of expressive conduct protected by the First Amendment. The defendant in *Spence* taped a peace symbol to a United States flag, and hung the flag upside-down from his window as a protest of the Cambodian invasion and the Kent State killings.<sup>74</sup> The state prosecuted him under a flag desecration statute, which the Court held violated the First Amendment as applied to the defendant’s communicative act.<sup>75</sup> The case forced the Court to articulate a standard for when expressive conduct should be treated as speech protected under the First Amendment. The Court insisted that the defendant’s conduct be evaluated in light of “the factual context and environment in which it was undertaken. . . .”<sup>76</sup> The *Spence* Court explained that the defendant’s conduct was expressive because “[a]n intent to

convey a particularized message was present, and in the surrounding circumstances the likelihood was great that the message would be understood by those who viewed it.”<sup>77</sup>

The Court recently modified the *Spence* test in *Hurley v. Irish-American Gay, Lesbian & Bisexual Group of Boston*,<sup>78</sup> holding that parade organizers’ refusal to include a gay, lesbian and bisexual parade contingent was covered by the First Amendment.<sup>79</sup> The Court characterized parading as a “form of expression” and the parade organizers’ selecting parade contingents as a “presentation of an edited compilation of speech generated by other persons.”<sup>80</sup> The Court admitted that the parade failed to convey a particularized message as required by *Spence*.<sup>81</sup> But it rejected the particularized message requirement of the *Spence* test as inconsistent with well-established protection of a “painting of Jackson Pollock, music of Arnold Schoenberg, or Jabberwocky verse of Lewis Carroll,” all of which it apparently felt conveyed non-particularized messages.<sup>82</sup> After *Hurley*, therefore, a “narrow, succinctly articulable message is not a condition of constitutional protection.”<sup>83</sup>

The major variable in modern First Amendment jurisprudence is “content,” which roughly corresponds to what most people call “meaning.”<sup>84</sup> Unsurprisingly, then, difficulty with the concept of meaning lies at the heart of the Court’s problems. The *Spence* test in particular fails to adequately distinguish the source and content of the speaker’s meaning from the audience’s understanding and reaction. First, the Court seems to believe that every human act has “meaning,” and thus may convey a “message.” For example, in holding in *Dallas v. Stanglin* that social dancing is not speech, the Court noted that “some kernel of expression” can be found in all human activity.<sup>85</sup> This conception of “found meaning”<sup>86</sup> puts us on a misleading path, because it suggests that the meaning of speech is not speaker’s meaning but hearer’s meaning. But if meaning can be “found” in this way, meaning proliferates and the boundaries between protected and unprotected conduct blur.

The Court’s test also unacceptably depends on the notion of audience effects. For example, in belatedly deciding that movies are speech, the Court noted that they “may affect public attitudes and behavior in a variety of ways, ranging from direct espousal of a political or social doctrine to the subtle shaping of thought which characterizes all artistic expression.”<sup>87</sup> Here, the Court seems to suggest that meaning can consist in some vague notion of “audience effects.” The notion of audience effects may be useful for handling speech acts with no ascertainable meaning, like displaying and performing works of art or music. But like “found meaning,” “audience effects” doesn’t usefully constrain the range of meaningful acts. Such meaning could be found in natural phenomena like eclipses and earthquakes.<sup>88</sup> Because meaning can be found in all human acts under the Court’s conception, and can consist of subtle effects on audiences, it isn’t a sufficient boundary criterion. The Court must still define which meaningful acts count and which don’t.

The Court has tried to solve the incorrigibility of meaning by using the variable of intent. But it

seems clear that the notion of intent articulated in *O'Brien*, that “the person engaging in the conduct intends thereby to express an idea,” has not solved the problem that any act could be so intended.<sup>89</sup> An “apparently limitless variety of conduct can be labeled ‘speech’” if speech is defined in terms of the actor’s “intend[ing] thereby to express an idea.”<sup>90</sup> *O'Brien* suggests that only the speaker’s subjective intent is relevant. This approach fails to adequately account for language conventions, which, by forcing the speaker to conform to a language convention the audience will understand, transform a bare propositional act into an act of communication.

We can “find” meaning in any human act and any human act can be intended by the actor to “express” meaning. But “found meaning” turns on observers, effacing the actor, while the latter notion turns on actors, effacing the audience. In the Court’s approach, meaning can be found no matter what the actor intended, and can be intended whether or not others might “find” it.<sup>91</sup> As a result, the variable of intent doesn’t solve the problem of too much meaning.

### 1. ***Expressive Conduct as a Speech Act***

The Court has correctly identified meaning, intent and audience understanding as crucial to speaking, but it lacks a theory of how they are connected. Speech act theory can provide such a connection. Under speech act theory, there are three points crucial to performing a speech act. First, the speaker must intend that the hearer grasp illocutionary intent.<sup>92</sup> Second, the meaning that matters is utterance meaning. Third, the actor must intend that the hearer grasp the illocutionary force through the hearer’s knowledge of the conventions that govern meaning and intent, which requires an internal connection between the two.<sup>93</sup>

The first major problem with the Court’s approach is that it treats intent and meaning as disconnected issues. Thus in *O'Brien* it refused to let the speaker’s intent alone define the boundary of speech, while in *Stanglin* it refused to let found meaning alone define speech. And in *Spence* and *Hurley* it attempted to link intent and meaning, but through the device of audience understanding, arguably viewed probabilistically. The Court would be better off defining intent and meaning intersubjectively in the first place.<sup>94</sup> It could define meaning primarily in terms of utterance meaning, which is fundamentally objective and intersubjective. Utterance meaning significantly restricts the range of meanings that a human act can have, and generally confines the proliferation of meaning.

This approach would exclude, for example, the concept of found meaning, which bears no relation to the speaker’s intended utterance. Under this approach, the *Stanglin* Court would not need to struggle with the potential for found meaning in recreational dancing. Indeed, the Court’s real problem with recreational dancing was intent, not meaning. There was no obvious intent to communicate in *Stanglin*, because the conventions surrounding recreational dancing are quite different from those surrounding other forms of dancing, like classical ballet.<sup>95</sup> In contrast, *Spence*

presented a clear case of intent to communicate in a conventional way. The defendant deliberately chose symbols, the United States flag and the peace symbol, which have clear utterance meaning. Moreover, flags are in a sense a medium of expression: Doing things to flags, under certain circumstances, is a conventional way of making political statements.<sup>96</sup> The utterance meaning in *Spence* was therefore relatively clear to the Court.

The Court's second error lies in failing to adequately recognize illocutionary acts and the role of illocutionary force. For First Amendment purposes, the relevant intent is the speaker's intent that the hearer understand the act as a speech act—particularly as an illocutionary act. But the Supreme Court thinks of meaning mainly as propositional content. Without illocutionary force, a speech act is either propositional or perlocutionary, and the speaker can only have propositional or perlocutionary intent.

Going back to Alice may make this clearer. In thing mode, we can recognize that Alice's software has meaning, and that it also has effects. If we think of speaking in terms of acts, but ignore illocutionary force, we still can't easily distinguish software published for an expository purpose from software published for someone's use. Proper understanding of publishing software as a speech act must consider the speaker's illocutionary intent, especially all the illocutionary forces that go along with genuine scientific publication.

The Court's approach shows us some of what is misguided about asking "is software speech?" Ignoring the illocutionary aspect of speaking drives us to view speech works as disembodied utterances, things in the physical world. We then ask whether that thing—in this case, software—has meaning or effects. And if we believe that most people wouldn't grasp its meaning, we end up thinking that the only or dominant intent is perlocutionary or effect-oriented.

Campaign finance regulation supplies a simple example of the importance of illocutionary force in relation to speaker's intent. Under *Buckley*, "express advocacy" of a clearly identified candidate may be subject to regulation, but not so-called "issue advocacy."<sup>97</sup> Whether speech constitutes express advocacy is to be determined by the words themselves,<sup>98</sup> and the Court even listed some "magic words" that it deemed "express words of advocacy."<sup>99</sup> One may dispute the soundness of this approach, but my point is simply that the Court is following the speech act approach here; these words are seen as linguistic indicators of the force of advocating that people vote for a candidate. Indeed, the Court has expressly referred to express advocacy as a "directive."<sup>100</sup>

A more complex example of the Court's occasional recognition of illocutionary force appears in its Establishment Clause decisions. The Court applies a three-pronged test in such cases; a statute or official practice that touches upon religion is permissible under the Establishment Clause if it has a secular purpose, neither advances nor inhibits religion in its principal or primary effect, and

does not foster an excessive entanglement with religion.<sup>101</sup> The Court’s inquiry in these cases can amount to asking whether the government’s conduct constitutes a certain kind of speech act.

In assessing the constitutionality of a period of silence for “voluntary prayer or meditation,” for example, the Court noted in *Wallace v. Jaffree* that “whenever the State itself speaks on a religious subject, one of the questions that we must ask is ‘whether the government intends to convey a message of endorsement or disapproval of religion.’”<sup>102</sup> Government may present a religious text with the intent to endorse or disapprove the text’s utterance meaning, or with some other intent that is neutral with respect to the text’s meaning. In speech act terms, the Court looks at the illocutionary force of the government’s actions.

Justice O’Connor’s “endorsement” approach to the three-pronged Establishment Clause test in *Lynch v. Donnelly*<sup>103</sup> is also a clear example of speech act analysis. O’Connor frames her analysis of the “purpose” prong in terms of illocutionary force, specifically whether the speech act is expressive.<sup>104</sup> The effects prong is couched in terms of conventional meaning:

If the audience is large, as it always is when government “speaks” by word or deed, some portion of the audience will inevitably receive a message determined by the “objective” content of the statement, and some portion will inevitably receive the intended message. Examination of both the subjective and the objective components of the message communicated by a government action is therefore necessary to determine whether the action carries a forbidden meaning.<sup>105</sup>

In sum, her approach recognizes that “[t]he meaning of a statement to its audience depends both on the intention of the speaker and on the ‘objective’ meaning of the statement in the community.”<sup>106</sup>

*Allegheny County v. ACLU*<sup>107</sup> may provide the clearest example of all. At issue were two holiday displays located on public property: a crèche on the Grand Staircase of the county courthouse, and a Hanukkah menorah placed near outside the City-County Building.<sup>108</sup> Although there was no clear majority, the opinion stating the judgment of the Court adopted Justice O’Connor’s analytical framework first articulated in *Lynch*:<sup>109</sup> “[t]he effect of the display depends upon the message that the government’s practice communicates: the question is ‘what viewers may fairly understand to be the purpose of the display,’”<sup>110</sup> i.e., the government’s illocutionary point.

Answering this question required the Court to examine the conventional or “reasonable” meaning associated with the artifacts used in the display, as well as their location and context: “a typical museum setting, though not neutralizing the religious content of a religious painting, negates any message of endorsement of that content.”<sup>111</sup> The Court concluded that the county’s crèche display “communicat[ed] a religious message,” not only because it was a crèche, but because it contained words of praise for God, and nothing in its setting detracted from that religious message.<sup>112</sup> In contrast, the menorah display not only contained a clear religious symbol, but also a Christmas

tree and a sign saluting liberty, creating an “overall holiday setting.”<sup>113</sup> The Court concluded that because the 45-foot tree, which it deemed a secular symbol, dominated the 18-foot menorah, and both were accompanied by the sign, the display was best characterized as having the effect of celebrating the winter holiday season.<sup>114</sup>

## 1. Software Speech Acts Are Covered by the First Amendment

In speech act terms, Alice performs a propositional act—a physical utterance act of producing marks on paper or a video screen. Her marks have some definite meaning within a language because anyone who understands that language understands what she says. Depending on the context, she thus performs various illocutionary acts: In publishing her source code, she states or asserts it, asks for criticism, and advocates that it be used, studied, or considered. By publishing it, Alice intended her publication of encryption software as an act of political expression.<sup>115</sup>

However, what is the covered “speech” in software? Those critical of *Bernstein* seem to doubt that software has any meaning the First Amendment would cover.<sup>116</sup> The simplest answer to that question is that Alice is stating a description of an algorithm, method, or procedure. The next few parts will attempt to unpack this argument a little. First, I will argue that the content of software is identical regardless of its form—be it on paper or in a computer—and thus deserving of coverage. Second, I will discuss how programming languages convey specific and precise meanings within the computer science community as part of that community’s discourse. Participation in the discourse and its utterance of procedures places software within the coverage of the First Amendment. Finally, I will sort out protected software speech acts from the mundane software acts, focusing particularly on software acts on the borderline between speech and non-speech acts.

### 1. Placing Software in the Context of Meaning, Medium and Form

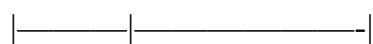
The encryption regulations require a license to export electronic encryption source code, but wholly exclude the export of encryption source code on paper.<sup>117</sup> Thus, the regulations draw an arbitrary distinction between the media of paper and pixels. Although the justifications for this distinction remain unclear, the government may have drawn this line based on the ease with which one may implement and disseminate encryption source code. Source code on paper requires additional steps of translation before today’s computers can recognize them as an executable program. As to the ease of dissemination, the average person can more cheaply and widely propagate information on the Internet than in other media.<sup>118</sup>

In drawing this distinction, the encryption regulations distinguish software in the forms of source code and object code from software expressed in natural language and mathematical algorithms. The regulations seem to ignore the meaning of source code to programmers. To sustain my

argument, I need to first explain the distinctions between meaning, medium, form and effect on audiences. Medium refers to the mechanical or physical vehicle of expression: paper, stone for some sculptures, sound waves for audible works, or electromagnetic waves for radio or TV broadcast. Form, on the other hand, pertains to the choice of communication method, such as choosing to use English instead of French, or words instead of pictures. Meaning is roughly independent of the medium, but is somewhat tied to its form because of the difficulty in translating one form into another. A news story has roughly the same meaning whether it is printed on paper or engraved in stone, while it is unclear that a person fully captures the meaning of that news story in a painting. Beyond form, medium or meaning, the effect that a work has on an observer is highly contextual<sup>119</sup> and may either be communicative or non-communicative.<sup>120</sup> As the Court has recognized, “[e]ach method of communicating ideas is a law unto itself and that law must reflect the differing natures, values, abuses and dangers of each method.”<sup>121</sup>

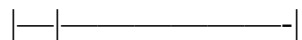
By drawing this arbitrary distinction between electronic and paper media, the government ignores the fact that publishing software can be a speech act, regardless of the medium of publication. As a text, software is indistinguishable from any other kind of linguistic “speech.” An example may clarify this argument. Suppose that Alice wanted to write a cryptographic program. To write this program, she would rely on prime numbers—which are essential to modern cryptography—but she would need to first determine which numbers are prime numbers. In mathematics, two numbers (a, n) are relatively prime if their greatest common divisor is equal to 1.<sup>122</sup> In mathematical language, we can say “gcd (a, n) = 1.” So, gcd (15, 28) = 1, but gcd (15, 27) = 3. This function is easy to set forth and compute for small numbers, but not for larger numbers. To compute larger numbers, Alice would need to rely on a method, such as Euclid’s algorithm.<sup>123</sup> As written by the great mathematician himself, Euclid’s algorithm would take the following form.<sup>124</sup> Let’s call this example (1).

A E B



|—| line G

C F D



To find the greatest common measure of two given numbers not relatively prime.

Let AB and CD be the two given numbers not relatively prime.

It is required to find the greatest common measure of AB and CD.

If now CD measures AB, since it also measures itself, then CD is a common measure of CD and AB. And it is manifest that it is also the greatest, for no greater number than CD

measures CD.

But, if CD does not measure AB, then, when the less of the numbers AB and CD being continually subtracted from the greater, some number is left which measures the one before it.

For a unit is not left, otherwise AB and CD would be relatively prime, which is contrary to the hypothesis.

Therefore some number is left which measures the one before it.

Now let CD, measuring BE, leave EA less than itself, let EA, measuring DF, leave FC less than itself, and let CF measure AE.

Since then, CF measures AE, and AE measures DF, therefore CF also measures DF. But it measures itself, therefore it also measures the whole CD.

But CD measures BE, therefore CF also measures BE. And it also measures EA, therefore it measures the whole BA.

But it also measures CD, therefore CF measures AB and CD. Therefore CF is a common measure of AB and CD.

I say next that it is also the greatest.

If CF is not the greatest common measure of AB and CD, then some number G, which is greater than CF, measures the numbers AB and CD.

Now, since G measures CD, and CD measures BE, therefore G also measures BE. But it also measures the whole BA, therefore it measures the remainder AE.

But AE measures DF, therefore G also measures DF. And it measures the whole DC, therefore it also measures the remainder CF, that is, the greater measures the less, which is impossible.

Therefore no number which is greater than CF measures the numbers AB and CD. Therefore CF is the greatest common measure of AB and CD.

Corollary[:] From this it is manifest that, *if a number measures two numbers, then it also measures their greatest common measure.*

Even written in English as in Example (1), Euclid's version is not as understandable as the next version from a class handout I found on the Internet.<sup>125</sup> Let's call this example (2):

UNIT 4

Programming Techniques

## Lesson 6 - Euclid's Algorithm

### OBJECTIVE

To allow students to further develop their problem solving skills

### CLASS EXERCISE:

In order to determine the greatest common divisor of two numbers, Euclid's Algorithm is stated as follows:

Divide the smaller number into the larger. If the remainder is not zero, replace the original two numbers by the remainder and the smaller of the two numbers, and repeat the division. Eventually the remainder will be zero, in which case the smaller number is the greatest common divisor.

With a partner, create pseudocode that accomplishes the description above.

Write a Pascal program that determines the GCD based on your pseudocode.

It is difficult to follow Example (1), but not Example (2).<sup>126</sup> Another way to express Euclid's algorithm is in "pseudo-code."<sup>127</sup> Call this example (3):

Algorithm gcd(a, n)

**begin**

$g_0 := n;$

$g_1 := a;$

$i := 1;$

**while**  $g_i \neq 0$  **do**

**begin**

$g_{i+1} := g_{i-1} \bmod g_i;$

```
i := i + 1
```

```
end;
```

```
gcd := gi-1
```

```
end
```

A fourth way to express Euclid's algorithm is in the C programming language.<sup>128</sup> Let's call this example (4):

```
/* returns GCD of x and y, assuming x and y are >0 */
```

```
int gcd (int x, int y)
```

```
{
```

```
int g;
```

```
if (x < 0)
```

```
x = -x;
```

```
if (y < 0)
```

```
y = -y;
```

```
if (x + y == 0)
```

```
ERROR;
```

```
g = y;
```

```
while (x > 0) {
```

```
g = x;
```

```
x = y % x;
```

```
y = g;
```

```
}
```

```
return g;
```

```
}
```

We have here the same basic “idea” stated in different forms. Each communicates roughly the same meaning to the competent reader. As a native English speaker, Example (2) is easiest for me to understand. Example (1), however, shows that English can be quite difficult to understand. With a little help from someone with mathematical training, I also understood Example (3). A computer science student who has not yet encountered Euclid’s algorithm might find Examples (3) or (4) more understandable. Certainly, a programmer could work backward from Example (4) to Example (2).

If Examples (1) and (2) are protected speech, it is unclear why Examples (3) and (4) are not. The only apparent distinction rests in the fact that Examples (3) and (4) are Euclid’s algorithm written in a programming language. Euclid’s algorithm remains Euclid’s algorithm whether it appears on paper or on a display terminal screen. Although Euclid’s algorithm appeared in different forms in the four preceding examples, it retained the same meaning and effect: the determination of whether large numbers are relatively prime. Examples (3) and (4) above clearly communicate a message that should be protected under *Spence* against discrimination based on viewpoint, content or subject-matter. Yet, the government’s encryption regulations ignore this fact.

## 1. Finding the “Speech” in Software

If Euclid’s algorithm has content, what is that content for First Amendment coverage purposes? A common categorization of software focuses on the genre of “instructions.”<sup>129</sup> This approach, however, presents a problem: software instructions seem to be addressed to a machine. The notion of “instructions,” however, contains an illocutionary force indicator that implies too much. Instruction-giving carries a fair amount of First Amendment baggage because it infuses action or conduct into “speech.”<sup>130</sup> In terms of utterance meaning, we should instead think of Euclid’s algorithm as a procedure. In this part, I discuss how programming languages are like and unlike natural languages, how computer science involves not only the stating of procedures but also the discussion of methodology for stating procedures, and how procedures are not equivalent to instructions.

## 1. *Programming Languages Convey Specific and Precise Meaning Within the*

## ***Computer Science Community***

We normally think of language in terms of natural languages like English or French. Language is, however, far more complex. Within each language, there exist sub-communities of speakers who have adopted a specialized subset of the language as their conventional form of communication. For instance, lay native English speakers might have difficulty understanding the technical vocabulary used by oncologists discussing a cancer patient's progress. Musicians use artificial notation for writing and reading music, while mathematicians and scientists employ terms and conventions that sound wholly incomprehensible to the untrained ear.<sup>131</sup> Yet the members of these fields understand each other.

Similarly, programming languages define a particular community. Programmers, computer scientists and other scientists use programming languages to communicate with each other. Writing programs resembles the writing of other kinds of works. Programmers and computer scientists, like more conventional writers or artists, view their works in terms of aesthetic and stylistic criteria of beauty and elegance.<sup>132</sup> As the District Court recognized, native speakers of programming languages “participate in a complex system of understood meanings within specific communities.”<sup>133</sup>

Because programming languages enable the precise and concise exposition of scientific ideas, they deserve the protection of First Amendment coverage. Instead of expressing mundane everyday thoughts,<sup>134</sup> programming languages express procedures and ideas about procedures without the ambiguity plaguing natural languages. For instance, programming languages avoid the difficulties that English has in describing algorithms and may stand as the only practical means of expressing certain algorithms that require precise articulation.<sup>135</sup> Programming languages provide the best means for communicating highly technical ideas—such as mathematical concepts—within the community of computer scientists and programmers.

An analogy to natural language can illustrate the communicative value of precision, and its relation to form. In using natural language to express procedures, it is easier to be precise in writing than in speaking. The difference lies in both the medium and the form: Written language uses punctuation, capitalization, and other visual tools to make communication more precise. For example, the convention of using quotation marks indicates to the reader that certain words should be treated literally, not as a reference. However, this precision disappears when one speaks: If I say, “say ‘your name’ aloud,” you may respond “your name,” or “Ezra.” Written English would avoid this possible confusion.

*Cohen v. California*<sup>136</sup> underscores the importance accorded to a speaker's precise choice of form. In *Cohen*, the Supreme Court reversed Cohen's conviction for disorderly conduct that arose when he wore a jacket bearing the words “Fuck the Draft” in a courthouse.<sup>137</sup> Instead of using the uncivil

phrase “fuck the draft,” Cohen could have stated “I strongly disapprove of the draft.” Although the content of these two statements is identical, the Supreme Court had no doubt that they differed in the message that they conveyed and that the First Amendment protected Cohen’s choice of language to express his emotional views.<sup>138</sup> When speakers express ideas, the First Amendment principle of “speaker autonomy” protects the form or means of expression.<sup>139</sup>

Programming languages make it possible to express exceedingly precise, particularized meanings. Computer programs are statements in languages peculiarly suited for expressing procedures and ideas about procedures. For this reason, asserting source code is a speech act.

### 1. *The Use of Software in the Scientific Discourse Places it Within the Coverage of the First Amendment*

In using and stating source code, programmers not only assert a particular procedure or set of procedures—they also participate in a scientific discourse about the asserted procedures. Such discourse occurs at several levels. First, they discuss the particular procedure or algorithm itself.<sup>140</sup> Second, individual algorithms often belong to a larger class of algorithms that address a set of problems.<sup>141</sup> Publishing an algorithm can create a discourse about those classes of algorithms and problems. Within the literature devoted to search algorithms, the act of publishing a search algorithm puts the publisher in the middle of that discourse.<sup>142</sup> Third, the publication of computer programs—algorithms in source code form—contributes to the development of mathematics itself.<sup>143</sup> Conversely, mathematical problems have stimulated various areas of computer science, including cryptography.<sup>144</sup>

This discourse is central to the marketplace of ideas in computer science. Scientific communities participate in a discourse through the processes of open publication and peer review, where new ideas are shared, evaluated, and independently criticized.<sup>145</sup> As a subset of computer science, cryptography possesses its own discourse. Taking advantage of the precision inherent in source code, cryptographers often publish their algorithms in source code form as “reference implementations,” benchmarks against which other implementation may be verified.<sup>146</sup> This free flow of ideas embodies the discursive relationship between speaker and audience that Professor Post considers necessary for First Amendment coverage.<sup>147</sup> Thus, in publishing her encryption program in the cryptographic “marketplace of ideas,” Alice does more than simply assert her algorithm; she seeks and expects comment or criticism about that algorithm.

The open publication of scientific works for evaluation and criticism stands as the scientific community’s central convention and places it within the coverage of the First Amendment.<sup>148</sup> While I have mainly argued that deference to speech subcommunity conventions is consistent with First Amendment values and useful to courts, we should not lose sight of the constitutive nature of subcommunity conventions and practices. We define science worlds in terms of

conventions like the scientific method, and we would not think someone a full-fledged member of a science world if he or she did not work within the scientific tradition. These mutually accepted practices constitute the subcommunity; conversely, to be a member of a subcommunity is to take a certain stance toward its conventions. Thus, conventions and practices are not merely signposts for external observers; they are what makes it possible for a subcommunity to be a subcommunity, and for artists or programmers to be members of their respective worlds. Publishing her source code in accordance with the tradition of open scientific publication is one way that Alice affirms her membership in the world of computer science.

### 1. **Software “Utters” Procedures Covered by the First Amendment**

By characterizing software as instructions, many people imply that publishing software corresponds to giving instructions.<sup>149</sup> If a person gives instructions to a computer and not to humans, the First Amendment would not be implicated. It is misleading to think of software as instructions however, because giving instructions differs from stating a procedure. Computer programming, computer science, and programming languages are fundamentally about procedures, not instructions.<sup>150</sup> Euclid’s algorithm is a mathematical procedure, and writing it in a programming language does not change that fact. The content of a computer program embodies at least the particular procedure that it contains.

When used in speech acts, procedures are not necessarily instructions. A chocolate cake recipe describes a procedure, but not every speech act involving it entails the giving of instructions. The recipe involves instructions when I utter the recipe to someone with the intent that the person bake a cake according to the recipe. Yet, when a copy editor performs a grammar or spelling check on the recipe to include it in a cookbook, its “recipe-ness” is hardly relevant. The editor treats the recipe as a linguistic object and checks to see if it conforms to our rules of language. Moreover, I might buy the cookbook as a gift. My act of giving the cookbook to a friend does not involve my “instructing” him to try a particular recipe. It seems odd to think that I am instructing him when I might not even know how to bake the cake myself. Furthermore, when I cook with a recipe, I understand the recipes as procedures, not as instructions. I have many cookbooks, but I rarely follow any particular recipe. Instead, I study several different recipes for a dish, identify its “essence,” and then create my own version. When I do this, I do not follow any particular set of instructions. I treat each recipe as a text and learn from them, similar to reading many cases and distilling the majority and minority opinions on an issue.<sup>151</sup> Computer programmers often treat programs the same way.<sup>152</sup> These various ways of interacting with a text become “mushed together” when we characterize a recipe, algorithm, or software as “instructions.”

So the best way to think of Euclid’s algorithm, or any algorithm, is not as “instructions” but as procedures. The characterization of “speech” as procedures does not disqualify it from coverage.<sup>153</sup> The First Amendment issues associated with procedures flow from acts done with

procedures, like actually executing them<sup>154</sup> or teaching others to execute the procedures.<sup>155</sup> In short, a computer program in source code form is a procedure written in a programming language. When Alice publishes her program, she performs the speech act of uttering a procedure.

### 1. ***Beyond the Academic Setting: Other Uses of Software Are Protected “Speech”***

Many software acts fall into the same category as Alice’s intended publication of her source code on the Internet for academic purposes. Given the irrelevance of the physical medium to our inquiry,<sup>156</sup> the First Amendment should cover source code published either in a journal<sup>157</sup> or on the Internet. Although the coverage argument relies on the illocutionary force of conventions in a scientific discourse,<sup>158</sup> the coverage characterization should not depend on the status of the declarant. It should not matter that Alice is a professor or a mere programmer, as long as she publishes with a similar intent. Nor should it matter that Alice merely communicates her program to a community’s subset—a class, conference, or colleagues—instead of to the world or the computer science community at large. Teaching in a class, presenting work at academic conferences, and sharing work with colleagues for review and criticism appeal to the same conventions that imbue her act with the illocutionary force of a scientific discourse.<sup>159</sup> As long as Alice’s communications are consistent with conventional scientific communicative practices, she has performed a speech act. Thus, any programmers who publish their source code—on the Internet, in Usenet newsgroups, or on mailing lists—with the intent for others to read and study the source code are performing a speech act covered by the First Amendment.

### 1. **Sorting Protected Speech Acts from Mundane Software Acts**

The treatment of freedom of speech in terms of speech-acts avoids a number of conceptual confusions. To accomplish that goal, speech-act theory provides a framework that formalizes meaning in relation to a speaker’s intent and in terms of sub-communities’ conventions and practices. This part categorizes software acts based on that framework. While traditional speech-act methodology underpins this categorization, First Amendment doctrine itself creates a penumbra around “core” speech acts.<sup>160</sup> So this part attempts to isolate core software speech acts from non-speech acts and to address borderline situations in light of First Amendment doctrines.

### 1. **Clear Cases of Non-Speech Acts**

There are software acts that are not speech acts. Often, aspects of the act or the context negate any claim to the communicative intent that is necessary for coverage. For example, when Microsoft sells software in object code form and prohibits viewing the object code, it is saying, “don’t read the software even if you can.”<sup>161</sup> The dissemination of “autonomous” software—such as viruses or Trojan horses—for malicious purposes provides another example where the use of

software does not constitute a speech act. Commentators have asked how First Amendment coverage of software can be reconciled with concerns about computer viruses and other “malicious” software,<sup>162</sup> given the unlawful nature of the act.<sup>163</sup> The simple answer lies in the fact that releasing a virus or worm onto the Internet lacks any communicative intent, and therefore can not be a speech act.<sup>164</sup>

The same answer applies to instances where hackers cause damage over the Internet by exploiting a security flaw in an Internet site. A person may create a web page that contains the words “Delete All” that, when clicked, deletes the innocent browser’s hard drive.<sup>165</sup> In that case, the person who created this trap did not utter “Delete All” with communicative intent. Even if the words “Delete All” arguably constitute a message, this categorization would torture the presumption of coverage for linguistic acts and ignores the issue of illocutionary intent. The actor’s goal of causing the erasure of innocent victims’ hard drives is not illocutionary: The actor does not intend to achieve that goal by having the victims understand the utterance as causing the erasure. The actor’s goal remains concealed and is unlikely to succeed if openly declared. Cases of this sort isolate the linguistic part of an act, but ignore the total act in the total situation. In sum, a lack of communicative intent places an act outside of the First Amendment’s coverage.

## 1. ***Cases on the Borderline Between Speech Acts and Non-Speech Acts***

Some software acts are harder to characterize. I set aside problems arising from our inability to read minds, and instead focus on two main classes of software acts: (a) those that lack communicative intent but for which the law imputes communicative intent; and (b) those that are done with communicative as well as other intents.

### 1. **Acts Involving a Legally Imputed Communicative Intent**

The most obvious examples of acts to which the law imputes communicative intent are acts of dissemination performed by intermediaries, such as a bookstore’s selling a book or a delivery person’s tossing a newspaper on the front porch.<sup>166</sup> A bookstore may sell a book to make money, remaining indifferent as to whether anyone actually reads it. We would have to make strong assumptions about its transactions in order to say that the bookstore itself performed a speech act.<sup>167</sup> Nevertheless, First Amendment coverage traditionally applies to the distribution or selling of protected works.<sup>168</sup> For example, the Court has consistently held that selling a book is as much a speech act as giving it away.<sup>169</sup> From the Court’s approach, one might say that the protection of publishing—a speech act at the core of First Amendment coverage—requires the strategic coverage of acts relating to the circulation and distribution of published works.<sup>170</sup>

Similarly, the act of publishing source code to a general audience ought to fall within the First Amendment’s coverage. If Alice publishes for a general audience that is less likely to understand

the source code, suspicion may grow that Alice distributes her work for others to use rather than to communicate.<sup>171</sup> The publication to a general audience should not, however, change the coverage characterization because many scientific and technical publications—such as *Scientific American*—target a general audience.<sup>172</sup> The government appeared to agree with this premise when it failed to require an export license for the worldwide publication of the book *Applied Cryptography*, which discusses encryption software and contains a print appendix of encryption source code.<sup>173</sup> The publication of a book along with a disk or CD-ROM containing the same source code should not be treated any differently.<sup>174</sup>

## 1. Acts Involving the Use of Software

Another category of borderline speech acts involves the use of software in our everyday life. Software permeates our lives, from controlling our home heating or alarm system to word processing or browsing the Internet to search for information. In some situations, software appears so closely related to speech acts that both the use of the software in a speech act and the software itself should fall within the coverage of the First Amendment.

As a threshold matter, we need to distinguish between publishing software and using software. People, including judges, seem to confuse these two wholly different kinds of acts.<sup>175</sup> One may read a recipe, but using the recipe to prepare food is not in itself a speech act. That does not mean, however, that using software is never a speech act. Using software might be part of a larger speech act, such as when one writes a social science article by performing statistical analyses with software.

Encryption software presents a situation in which using software is a speech act. Because certain things have a special relationship to speaking, even facially speech-neutral regulation can bring the First Amendment into play.<sup>176</sup> Tools of speech—like printing presses, paper and ink, or newsracks—have a close “nexus” to expression,<sup>177</sup> so that any government regulation that may aim at their use in communication becomes suspicious.<sup>178</sup> Encryption software constitutes one such tool of speech. An analogy to envelopes will illustrate this point. An important aspect of speaking is being able to speak to one’s intended audience but not others.<sup>179</sup> A ban on using envelopes to assure some level of privacy for written correspondence would likely affect the content of written correspondence and cause people to shift to some other means of private communication. If using envelopes for written correspondence is a kind of speech act, then using encryption for electronic correspondence should be as well.<sup>180</sup>

## 1. Acts Involving Multiple Intents

The other major category of borderline speech acts involves acts done with multiple intents.<sup>181</sup> Because this is an enormous category, this part will focus on one type of added intent: the intent

to use the software.<sup>182</sup> This added intent generates the main source of concern in software speech acts. In other words, the problem focuses on whether the act of disseminating software—intending both to communicate and to provide the software—is a speech act.

The literature provides two perspectives on this question. The first view argues that the existence of an added intention devoid of any protected meaning does not in itself negate the protection accorded to the speech act.<sup>183</sup> A different approach attempts to discern the predominant motive or intent.<sup>184</sup> This second approach appears reasonable if it does not create any category excluding the possibility that an actor may have the proper communicative intent. The superior approach, in my opinion, lies in precisely defining the speech act of concern in terms of the prohibited intent and with great sensitivity to line-drawing issues.

### 1. Distributing Software for Personal Use

Let us suppose that Alice gives people encryption source code for them to review *and* to use in protecting the privacy of their electronic mail. Would this additional purpose detract from the communicative intent that makes an act a speech act? The answer must be a qualified “no,” in light of general First Amendment principles. Many works of speech, like instructions and how-to books, can be used as well as read. The author of a book on how to avoid probate undoubtedly intends for the book to be read and used.

At some point on this spectrum, the act of distributing software will occur more for its use than for study or some other illocutionary purpose. *United States v. Mendelsohn* provides a good illustration of this point.<sup>185</sup> In *Mendelsohn*, the defendants were convicted of aiding and abetting the interstate transportation of wagering paraphernalia that consisted of a computer disk containing a program called SOAP (Sports Office Accounting Program).<sup>186</sup> On appeal, the defendants argued that they were entitled to a First Amendment defense because “SOAP is speech.”<sup>187</sup> Although acknowledging that a computer program might warrant First Amendment protection under some circumstances, the Ninth Circuit decided that the integral and essential role played by SOAP in an ongoing criminal activity precluded any First Amendment defense.<sup>188</sup> Such cases involve no obvious illocutionary intent, and thus the act is not a speech act in the first place.<sup>189</sup>

### 1. Writing Software for Publication and Personal Use

Let us now suppose that Alice writes a program and intends to publish the source code for others to read, but also intends to use the program herself. Would this additional purpose detract from her communicative intent? Here again, the answer must be “no.” After all, we recognize certain solitary linguistic acts as speech acts, even if there is no audience.<sup>190</sup> One still speaks, for example, when writing a personal diary kept under lock and key.

Much the same problem plagues the general enterprise of scientific work. The case for coverage is strongest when the scientific work is part of a larger act that culminates in publication.<sup>191</sup> However, publishing the blueprints or designs of one's device is no less an act of publication because another might use the device. Writing with the intent to publish is a speech act. The difficult case arises when it is unclear whether one intends to publish. My position, however, is that acts such as designing devices and writing software are speech acts because of the conventions of the relevant scientific community. Because such acts are so often part of larger speech acts such as publication, the exclusion of these mixed-intent acts from the First Amendment's coverage risks an undue distortion of scientific communication.

### **1. Acts Involving Viruses and Other "Dangerous" Software**

Let's return to the virus hypothetical.<sup>192</sup> The main concern lies in the fact that the software may be "diverted" toward unlawful purposes, regardless of the speaker's intent. This concern is, however, not unique to software. It also applies to other types of information usable for mischief or harassment, whether highly technical like information about nuclear weapons, or utterly mundane like a person's name, address or telephone number.

Even if the virus author merely posts the source code and fails to release it in active form, the issue remains whether the posting was done with an intent to communicate. If the author claims that she intended it to communicate, we would need to examine the context to decide the plausibility of that claim. There will often be a plausible claim. There is no question that people study viruses and other dangerous software in order to prevent or relieve harm.<sup>193</sup> One way to control a virus is to publish its source code so that systems operators can disable or protect against it. Communicating a virus' source code as part of such an effort qualifies as a speech act because the publisher intends to communicate how the virus works in a conventional way. In fact, one could imagine entire journals or Internet sites devoted to viruses and other dangerous software.<sup>194</sup> When such publications aim to alert the world to these dangers, their intent is clearly communicative.

### **1. Responding To The Critics of Software as Speech**

This part focuses on the arguments against considering software as speech. These arguments appear in two different forms. The first argument contends that the First Amendment does not cover "functional things." In other words, the functionality of software disqualifies it from being treated as speech, regardless of any textual meaning it might have. The second argument asserts that the First Amendment requires that audiences understand a speaker's message for the message to qualify as protected speech. Therefore, because most people are unable to "read" software, software is not speech. Taken together, the "functionality" and "incomprehensibility" arguments

support a third argument: that software's effects are non-communicative even if it is speech.

Both arguments are flawed, although in different ways. The functionality argument frames the First Amendment coverage issue in terms of the nature of the thing—is it expressive or functional?—and essentially attributes that nature to acts performed by using the thing. This ontological approach makes no sense. Instead, we must focus on the actor's act. Asking whether source code is “expressive” differs from asking whether a soft-

ware act is “expressive” because the former question entirely ignores the putative speaker.

The incomprehensibility argument highlights the issue of audience understanding. We cannot consider audience understanding without referring to a sub-community’s conventions. No logical relationship exists between an act’s conventional meaning within a small subcommunity and in the larger community. Even though few actually comprehend Braille, there is no doubt that Braille holds conventional meanings for its readers. Thus, we must reject any notion of audience understanding that insists that most people must comprehend a form of speech.<sup>195</sup>

The most that the functionality and incomprehensibility arguments show is that publishing software could be a non-speech act. Yet, a variety of acts using fully comprehensible, non-software information can also be non-speech acts. So, the basic questions remain: (1) “is this person really speaking?” and (2) “is this person also doing something else?” Analyzing software as a thing or based on its general understanding does not resolve either of these two questions. In short, both arguments, incomprehensibility and functionality, must be rejected in analyzing the coverage doctrine.

This Part will analyze the critics’ arguments in detail. Although the functionality argument is more important, it also appeals to the incomprehensibility argument. The incomprehensibility argument, however, largely stands on its own. Thus, this Part will begin with incomprehensibility.

## 1. The Incomprehensibility Argument

The incomprehensibility argument comes in two versions. The pure ontological argument considers software programmers’ work as engineering, rather than writing, thinking or any other act covered by the First Amendment.<sup>196</sup> The second version concedes that source code is “speech” for programmers, but emphasizes the way most people understand source code.<sup>197</sup> Both versions raise the question of the audience’s role in First Amendment analysis. The question is thus whether a mass audience’s inability to read source code should matter to First Amendment coverage.

### 1. *The “Programming Language Is Not a Linguistic Form that Expresses Ideas” Argument*

The doctrinal basis for inquiring about a message’s comprehensibility lies in *Spence*’s requirement of audience understanding.<sup>198</sup> *Spence* however strongly implies that this inquiry becomes unnecessary when speakers use words.<sup>199</sup> Thus, *Spence* is inapplicable to Alice’s situation. Instead of being expressive conduct, publishing source code is conventional linguistic

conduct.

Yet the critics offer two flawed arguments to rebut this contention. Their first argument, as championed by the court in *Junger v. Daley*,<sup>200</sup> contends that software is really “conduct” and not speech.<sup>201</sup> Rejecting any appeal to software’s linguistic form,<sup>202</sup> the *Junger* court analogized software to the unprotected category of “fighting words.”<sup>203</sup> This analogy must fail, however, because it confuses coverage and protection. As the Supreme Court held in *R.A.V. v. St. Paul*, fighting words are “not entirely invisible” to the First Amendment.<sup>204</sup> The government may regulate speech in categories traditionally considered unprotected by the First Amendment—like defamation and obscenity—because of their “constitutionally proscribable content.”<sup>205</sup> Hence, regulations based on grounds other than content, like the fact that software is conduct rather than speech, should not stand. In any case, the *Junger* court cannot appeal to *Chaplinsky* to buttress its argument. *Chaplinsky* simply recognized that categories of speech become “proscribable” based on their “fit” with First Amendment values.<sup>206</sup> Regardless of whether everyone understands source code, this software language fits within those covered values: The dissemination of source code plays an essential part in the exposition of ideas within the computer science community.<sup>207</sup> Whether the First Amendment protects a speech act is an entirely different question from whether something is “speech” in the first place.

The second argument made by the critics is that, because they are not natural languages like English or French, programming languages should not be covered by the First Amendment. As the argument goes, programmers neither read nor write.<sup>208</sup> The characterization of software as containing “information” rather than “meaning” testifies to this largely unstated belief.<sup>209</sup> From this perspective, the reading of source code by a programmer would constitute “reverse-engineering.”<sup>210</sup> Instead of writing, they engineer or build, making the communicative aspect of source code no different from looking at how a car works. In other words, a programmer is like a chemist who must unbake a slice of cake to produce the recipe and a list of the raw ingredients. However, to the extent that source code is like a recipe, the difference is obvious. A slice of cake has no utterance meaning, while a recipe does. Like a recipe, source code has utterance meaning.<sup>211</sup> The difference between a procedure written in English, a mathematical algorithm, and source code stems from purely formal delineations. Every well-formed statement in a language has utterance meaning, and this fact applies to statements in programming languages as well. Moreover, the key difference between reading and reverse-engineering lies in reading’s dependence on conventionality. The programmers do not make “sophisticated inferences” from the program’s behavior or physical form; they read and understand what the source code’s author stated.<sup>212</sup> As with natural languages, the relationship between what source code states and the meaning that a trained programmer derives from it is based on vocabulary and syntax.<sup>213</sup> Similar to the use of natural languages, a programmer publishing source code intends for other programmers to understand the source code linguistically. The critics thus ignore an important point: The speaker’s intent that the audience understand source code based on its knowledge of

programming languages and the communicative practices and conventions of computer science, brings the publishing of source code into the category of covered speech acts.

### 1. ***The “Software Is Not Sufficiently Communicative” Argument***

The Court treats non-linguistic conduct differently from linguistic conduct because of a presumption about intent and conventionality. However, using language to communicate more or less guarantees that the actor intends to communicate in a conventional way. Therefore, programming languages are languages for First Amendment purposes and source code is, as a doctrinal matter, pure speech.

However, some critics have argued the contrary. The district court in *Junger* relied on *Spence* to decide that encryption source code “is not sufficiently communicative” to constitute expressive conduct for First Amendment purposes because it does not convey “an unmistakable message” and because its communicative nature is not “overwhelmingly apparent.”<sup>214</sup> Computer scientists and programmers would be surprised to hear that their source code does not “convey an unmistakable message,” given the precision of source code.<sup>215</sup> Similarly, any programmer who publishes source code to another programmer would be astonished to hear that the communicative nature of her act was not overwhelmingly apparent.

The *Junger* court’s use of *Spence* raises an issue as to the role of audiences in coverage analysis: To whom must software “convey an unmistakable message” and to whom must its “communicative nature” be “overwhelmingly apparent”? Arguably, the court is right if the relevant audience is everyone. However, if coverage requires a “great likelihood” that a message be understood by everyone who viewed or heard it,<sup>216</sup> then the First Amendment would not cover many obvious cases of speech. For instance, very few people can understand obscure languages like Navaho, or specialized technical languages like mathematics. Should the complicated math in Einstein’s theory of relativity, when published on the Internet or in a book, not be considered “speech” because most people do not understand it? Doing so would over-stretch *Spence*. The better interpretation of *Spence* is to comprehend audience understanding as representing what this article terms “meaning by convention.”<sup>217</sup> Hence, the size or type of audiences should not affect coverage.

### 1. ***The “An Audience Does Not Understand Programming Language” Argument***

Critics who maintain that audience understanding does matter could try a different argument: Even if source code were published to communicate a message, people would be more interested in the software for its utility than in the message.<sup>218</sup> In other words, the First Amendment does not cover software because what the speaker intends as a message is understood by a lay audience as a tool. For them software is like some meaningless noise or a useful tool.<sup>219</sup>

But we often treat acts as speech acts even when we do not understand what was said, such as when someone speaks in a foreign or technical language, or when we view abstract art. Even without understanding meaning, we can recognize from our knowledge of social conventions and practices that the speaker is attempting to communicate. Accordingly, those unable to read source code could nevertheless recognize that: (i) Alice’s source code has utterance meaning to others; and that (ii) she is asserting something with meaning to others. Thus, non-programmers could understand that publishing software is a speech act with meaning and force, even though they do not comprehend what the software’s author said. In other words, they may without more recognize her to be attempting to communicate. What should matter for First Amendment coverage purposes is not that the audience actually understands a speech act’s propositional content or even its specific illocutionary force. What should matter is that the act can be recognized as a speech act, an attempt to communicate under a sub-community’s conventions.

### 1. ***The Incomprehensibility Argument Is a Red Herring***

No version of the incomprehensibility argument makes sense. The acceptance that source code has meaning logically entails that one may assert that meaning. Things that have no utterance meaning, like one’s hands, may be used in illocutionary acts.<sup>220</sup> Even if there are doubts about a particular act of publishing software being a speech act, there should be no doubt that publishing software is in general a speech act.

As a practical matter, incomprehensibility is a red herring. We do not have trouble with most unconventional speech acts—even if we are surprised to learn that they were speech acts to others—unless we associate them with baleful consequences. Indeed, the government’s interest in regulating source code exists whether or not source code is understandable to most people. Even if everyone could read encryption source code, the government could still argue that its use overseas would frustrate U.S. signals intelligence. After all, the same kinds of concerns plague “pure speech” that is not functional—such as the nuclear weapon information at issue in the *Progressive* case.<sup>221</sup> Yet, this concern bears no relation to incomprehensibility.<sup>222</sup> Thus, the allure of the incomprehensibility argument seems ultimately to turn on “functionality.” The problem, if there is one, is not source code’s incomprehensibility, but its effects.

### 1. **The Functionality Argument**

Some critics have claimed that source code, because of its functionality, is not the kind of thing that the First Amendment covers. In this Part, I unpack the possible meanings of functionality and conclude that the government’s concern about software’s functionality is a concern about the effects of someone’s using software. First, I discuss the fallacies in the critics’ functionality arguments. First Amendment case law does not rely on functionality to categorize speech. Yet,

the *Bernstein* critics have relied on that argument. In the process, they have confused the medium and the message, focused on the wrong speech acts for their analysis, and disregarded that the use of software can be a speech act. Second, I rebut the government’s claim that software speech acts only deserve intermediate instead of strict scrutiny. Functionality makes little sense as an analytical concept other than as a proxy for effect or harm. In fact, to target a particular kind of functionality, like cryptographic functionality, is content-based discrimination. The correct inquiry should focus on software acts, not software as a thing.

### 1. ***Fallacies in the Critics’ Functionality Arguments***

### 2. **Functionality Is Not a First Amendment Doctrine**

A threshold problem with the functionality argument lies in the fact that functionality is ill defined and has no obvious doctrinal equivalent. First Amendment case law does not recognize functionality as a basis for categorizing speech.<sup>223</sup> For instance, the weak protection accorded to fighting words derives from the idea that their use may objectively provoke violence. Similarly, the weak protection given to obscenity, child pornography, and indecency is unrelated to functionality.<sup>224</sup> The case law defines incitement in terms of both the speaker’s intent and the act’s likely effect, not in terms of functionality.<sup>225</sup>

If the case law recognized a functionality doctrine, what would it look like? Functionality cannot merely mean that the work of speech is useful, since instructions, recipes and manuals are both useful and covered by the First Amendment. Indeed, the First Amendment partly covers commercial speech because consumers can benefit from widespread information.<sup>226</sup> Similarly, functionality cannot simply mean that a form of speech could cause harm since much speech—chemistry books teaching bomb-making or calls to revolution—could cause harm.<sup>227</sup>

To state that software “functions” only means that one can use software to do something. Yet, many forms of “speech” can be used to do things. For instance, although charitable solicitations “function” to raise money, the First Amendment covers charitable appeals because they involve important interests like the communication of information, the dissemination and propagation of ideas, and the advocacy of causes.<sup>228</sup> To push the analogy further, erotic works “function” to sexually arouse people, seditious libel “functions” to subvert government, defamation “functions” to damage reputation, and textbooks “function” to confer knowledge and abilities. In short, there is no doctrinal foundation for not treating software as speech simply because it “functions.” This idea encompasses so much speech that it is useless as an analytical tool.

### 1. **Software Is Not a Machine or Machine Part**

The government and the courts have relied on the functionality argument, despite its logical problems as an analytical tool. In *Bernstein*, the government argued that source code differs from

blueprints, recipes, and “how-to” manuals because a person can use software to control the operation of a computer.<sup>229</sup> The dissent in *Bernstein IV* and the district court in *Junger* adopted this view in finding that source code is purely functional because, unlike other speech, it “actually performs the functions it describes.”<sup>230</sup>

These champions of functionality rely on two basic analogies. First, they argue that software is a device designed to plug into a computer.<sup>231</sup> In adopting this view, they completely ignore the linguistic form and text in which software is written.<sup>232</sup> Second, they regard software as a template that only embodies instructions to a machine.<sup>233</sup> This template analogy suggests that, even if software is a text, its “audience” consists of computers and not people.<sup>234</sup> Both analogies suggest that software is—by design or inherently—functional<sup>235</sup> and thus has little communicative aspect. Both analogies derive their force from looking at software as a thing, ignoring how one can speak software. Yet, these analogies are flawed because they confuse the medium and the message, focus on the wrong acts, and ignore the speech act characteristics of software publication.

### 1. The Critics Confuse the Medium and the Message

The oral argument in *Karn v. United States Dep’t of State*<sup>236</sup> presents an example of how critics confuse the medium and the message. During the oral argument, the D.C. Circuit presented a hypothetical about AWACS planes—ordinary planes converted to perform special functions. The court hypothesized that one could place this special function into a CD-ROM containing a computer program, then display this software as text or numbers on a screen, and finally transcribe it into a book that the First Amendment would cover. The court then asked, “Does it follow that the CD-ROM that got slipped into the hardware of the airplane is speech?”<sup>237</sup>

This question confuses the information recorded on the CD-ROM with the package consisting of the disk and the recorded information. The correct approach must distinguish between the software as text, the form of the text, the physical medium, and running the software. The information on the CD-ROM is a text, just as what is on the pages of a book or the digital music on a CD is a text. By considering the package as a whole, the D.C. Circuit thinks that the software on a physical CD-ROM is a machine part that can be inserted into the airplane.<sup>238</sup> The mechanical aspect of the medium, however, should not affect the issue of coverage. After all, copyright law teaches us not to confuse the work with the copy in which the work is fixed.<sup>239</sup> The inquiry should not focus on the medium on which the work is fixed.

### 1. The Critics Focus on the Wrong Acts

Coverage analysis should focus on acts, not things. To provide the correct result, the analysis must concentrate on the right acts. Yet the critics often confuse the core speech act of publishing

software with other software acts. For instance, the D.C. Circuit’s AWACS hypothetical focuses on the act of slipping the CD-ROM into the hardware. It is unclear why the court examined that particular act. Loading the CD-ROM software on the AWACS computer is a different act from communicating the software to a person. In addition, using the loaded software to fly the AWACS plane is also a different act.

The critics have also confused the mechanical acts performed by a machine with the message in software. Adopting this view, the D.C. Circuit stated that the AWACS software seemed more like a process that transforms an ordinary plane into an AWACS plane than a design manual for building the plane.<sup>240</sup> When Karn’s attorney stated that source code requires compilation, the judge replied that the computer—not a person—does the compiling.<sup>241</sup> In making that remark, the judge focused on the role of humans in the execution of a software act. Yet, the compilation step is immaterial because running or executing software differs from communicating it to a person, in the same way that following a recipe is not telling someone a recipe. In addition, the remark betrayed the judge’s belief that the only act that one could perform with the AWACS software was to execute it. Although this limitation may be true for the computer on an AWACS airplane, it does not apply to most computers: One could input the software into the computer simply to view, read or edit the software. That a person must use a machine to read a text is irrelevant to whether something is text. In sum, the critics have missed the crux of the coverage argument by focusing on the wrong acts and by ignoring the communicative aspect of software use.

### **1. The Critics Confuse Software as a Thing with Software as Speech Act: The Inherent Functionality Confusion**

The notion of “inherent” functionality attempts to answer the coverage question by looking at software as a thing and asking whether it is expressive or functional. In so doing, it ignores the intent of software speakers and the context in which software acts occur. This approach would view the words “Kill him!” as an order no matter how the words are expressed. In the previous sentence, the words are obviously not expressing an order. Software acts are neither inherently expressive nor inherently functional. This distinction between expression and function must always depend on the actor’s intent as viewed through the lens of conventions.<sup>242</sup>

The district court in *Junger* adopted this inherency approach when it categorized encryption source code as “inherently” functional because ordinary people consume it for its function.<sup>243</sup> The court viewed the expressiveness of software from the perspective of a computer user who is not a programmer; this approach caused the court to ignore the ways in which software authors might communicate with other programmers. *Junger* disregarded the communicative uses of, and the different audiences for, encryption source code in order to categorize such code as functional.<sup>244</sup> In adopting this approach, it failed to consider the possibility of illocutionary acts involving the software.

The D.C. Circuit’s template analogy further illustrates this ontological confusion. When a template guides a lathe or key-making machine,<sup>245</sup> the court explained, it has no other function than telling the machine what to do. The court asked whether software functions similarly to a template in guiding the lathe.<sup>246</sup> In analogizing software to a template, the court treated the template as a thing with no other function than instructing the machine. However, a person may use a template—whether a silhouette or a lathe control card—to communicate. A furniture maker may manufacture a wonderfully ornate table leg on a lathe. He would record all the operations needed to reproduce that table leg onto a lathe control card that a computerized lathe can read to display a three-dimensional image of the leg. The furniture maker could then publish the control card for others to use. The published control card communicates the furniture maker’s design despite having the function of instructing a machine.

The notion of “inherent” functionality or expressiveness confuses a thing, software, with an act—publishing software. This approach confuses the functionality of software with the functionality of publishing software. The “inherence” fallacy seems to say that, if a thing is functional, then acts done with it inherit the quality of functionality.<sup>247</sup> However, things are neither inherently functional nor inherently expressive, because people can use them both ways. This is true even though we tend to use things for one purpose or another. In other words, there is nothing to inhere because it all depends on the intent of the person using the software. This inherency fallacy infects every attempt to link the nature of software to software acts, or the nature of programming languages to acts done with them.

The Supreme Court’s analysis of trademark protection for color in *Qualitex Co. v. Jacobson Products Co., Inc.*<sup>248</sup> illustrates how the law can accommodate the illocutionary use of a functional feature.<sup>249</sup> The basic purpose of trademark law aims to allow consumers to distinguish a particular maker’s goods or services from those of others.<sup>250</sup> Qualitex had manufactured distinctively colored pads used by dry cleaners for some time when a rival began selling similarly colored pads. These pads were colored to hide stains,<sup>251</sup> but served to identify Qualitex as their manufacturer.<sup>252</sup> The traditional rule held that a color could only be trademarked as part of a distinctive design,<sup>253</sup> partly because color was considered functional.<sup>254</sup> Following this rule, the Ninth Circuit held that Qualitex could not register its “color alone” as a trademark. On appeal, the Supreme Court reversed and held that no such *per se* bar existed because colors can identify the source of a good. In other words, a mark’s ontological status as a color, fragrance, word or sign is irrelevant to this basic purpose.<sup>255</sup> The Court thus recognized that ontology does not determine functionality. The ontological status of a mark—what it is, whether color or words—tells us little about whether it is a trademark. Indeed, to use something intentionally “as a mark” is analogous to the speech act of identifying oneself as a work’s author.<sup>256</sup> Therefore, the ontological status of software should not determine whether the First Amendment covers software. What matters is how software is used in an act.

Human actions are usually described in reference to intentions. To think about First Amendment coverage as attaching to things obscures the role of intentions in a way that thinking of First Amendment coverage as attaching to speech acts does not. Many critics appear mesmerized by the belief that they must categorically decide what kind of thing software is.<sup>257</sup> Some believe that people can not use source code to communicate. Some ignore the possibility that an actor can intend to communicate software for its meaning or content—as text, not tool—because that possibility is not the “normal” thing people do with software.<sup>258</sup> These approaches beg the question because they focus on software’s “nature” as a thing. Actors, not things, intend to speak.

### 1. “Its Effects Are Unlike Those of Other Forms of Speech”

The government’s main argument in *Bernstein* focused on the fact that, when it is executed, software enables people to do things. Because of this “executable” characteristic, the government contends that software differs from works covered by the First Amendment. Many works of expression, however, provide ways of achieving a certain result because they are intended to be “executed.”<sup>259</sup> Choreography, musical scores, and stage direction are just a few examples of such works.<sup>260</sup> Within the context of a Shakespearean play, every line of dialogue represents an instruction to the actor to utter the words on the page. Similarly, musical scores provide instructions to the musicians who read them. Indeed, one can “execute” Bach’s score on an organ or on a computer, given the proper medium and form.<sup>261</sup> To take this argument a step further, many simple facts enable people to do things. If I want to call someone, I need a fact—a phone number. If I ask someone for a phone number and he replies “123-4567,” the respondent has performed the speech act of stating the phone number. And yet it would seem ludicrous to claim the act of saying a phone number is not protected simply because I now can execute the act of calling on a telephone. To allow the government to regulate software based only on this characteristic means that the government may control many works covered by the First Amendment.

A more sophisticated version of this argument concedes that much speech conveys a capacity to do something, but notes that in general such capacities are mediated by human agency.<sup>262</sup> According to this argument, software differs from such speech because it does not require human action.

The proper question, however, is whether this “executable” capacity is conveyed differently from publishing other information. The government seems to think so. At one point, it argued that a recipe for a cake is not a cake, but software is both the recipe and the cake.<sup>263</sup> This argument appears far too sweeping. Software is not a cake. Just as a recipe for a cake does not become a cake without a baker, encryption software does not perform without a person to use it. Only if it is used by a person, on a computer, will it have these effects.<sup>264</sup> If someone publishes bomb-

making information, it only has effects if someone else uses it to make a bomb. The effects always run through a person's use of it.

An important part of this more sophisticated argument depends on the fact that software can be used without being read or comprehended. Focusing on this point, the government would argue that the bomb manual and software situations differ because a person's understanding of the manual can mediate its harmful effects, whereas encryption software can create damaging effects without any human agency. It is unclear how or why this difference matters to a coverage analysis. Let us take leafletting as an illustration. People have a tendency to create litter by tossing leaflets on the street. This harm has a non-communicative effect because it is unnecessary for people to read the leaflet before they litter. The harm arises without mental mediation and occurs whether or not the leaflet conveyed a message. Most likely, the litterers largely consist of those who did not read the leaflet. By the government's argument, leafletting is not a covered speech act because many people would discard them on the street without reading them. Clearly, this argument sounds specious.

The issue, in short, is what people can do with computers, because executability is not really about software. Cutting to the heart of the matter, the court in *Bernstein IV* observed that computers will soon be able to respond directly to spoken commands.<sup>265</sup> Computers would then execute all sorts of commands or queries without any need for the mediation of a programming language. At that point, it would sound strange to say that the First Amendment does not cover some speech simply because a computer could execute it. If I ask my daughter to turn up the heat, I have performed a speech act even if I use the same words to command a computer-controlled thermostat. Thus, software is merely a procedure written in a language that today's computers can understand.

Executability is not merely a logical property of software, in the same way that "speechness" is not a logical property of sounds or marks. When we discuss executability, we discuss what people can do with computers. We do not talk about what software does in isolation. For coverage purposes, we should not treat functionality any differently from the risks of information use or abuse in First Amendment jurisprudence. A person can use a bomb-making manual to kill people or can use software to do something harmful. Standard doctrine already permits regulation of these sorts of effects, even though the causal chain runs through reading or understanding.<sup>266</sup>

### 1. ***Revisiting the Government's Argument in Bernstein: Functionality and Protection***

If the First Amendment covers some software acts as speech acts, we must then determine what level of scrutiny should apply to any functionality-based regulation of software speech acts. The government approaches this question by arguing that any statute that criminalizes the publication

of encryption source code based on its functionality is content-neutral.<sup>267</sup> Under this approach, even if source code can sometimes be speech, its functionality is a non-communicative aspect of software or a non-communicative effect of software acts.<sup>268</sup> Therefore, only intermediate scrutiny should apply to this statute.<sup>269</sup>

This way of thinking is erroneous for two reasons. First, functionality makes little sense as an analytical concept other than as a proxy for effects or harm. First Amendment doctrine already has the tools to address the harm that may result from speech acts. It does not need a distinct functionality doctrine.<sup>270</sup>

Second, the inquiry should focus on software acts, not software. To focus on software as a thing confuses software with what people do with software. It is like confusing money with what people do with money, or sound with what people do with sound. Although misused software can cause harm and the effects of using software can be non-communicative, publishing software differs from using software. Indeed, thinking of software as a thing increases the chances of confusing agency and thus responsibility: The speaker is not the user. First Amendment doctrine requires not only careful distinctions among acts, but also among actors.<sup>271</sup> Publishing information that may be misused does not logically entail that the publisher intended the harm, and the Court has generally required a showing that the speaker did so intend.<sup>272</sup> Thinking in terms of “what software does” permits the careless attribution to the publisher of the audience’s possible misuse of software.<sup>273</sup> It is not exactly the “heckler’s veto”<sup>274</sup> or “bad tendency”<sup>275</sup> but it is close.

Finally, to the extent that functionality must fit into the rubric of “content-based” vs. “content-neutral” regulation, functionality-based regulation is much closer to content-based than content-neutral regulation for the simple reason that the content of software is inextricable from its functionality.

## 1. **Standard Doctrines About Effects and Causation Can Handle Any Issue of Functionality**

The government argues that, even if software is “speech,” software is also functional. Therefore, *O’Brien* allows the regulation of software based on its functionality. The government’s concern with functionality concentrates on the possible harmful effects of a person’s use of the software. However, First Amendment doctrines that revolve around causation and moral agency already address the risks of harm from speech acts. As an attempt to craft a new doctrine, functionality is flawed because it ignores how harm is caused or who is responsible for it.

### 1. **Causation and Functionality**

The government’s functionality argument derives from the idea that, regardless of their

expectation or intent, when Alice publishes encryption source code, she causes harm because the source code can be used by foreign persons to frustrate the gathering of intelligence overseas.<sup>276</sup> The First Amendment is concerned with causation,<sup>277</sup> but that concern is more complex than the government suggests. In general, it is foreseeable that some information, when widely disseminated, will cause harm through unlawful or dangerous misuse.<sup>278</sup> It is, however, well-settled that the foreseeability of harm from general publication is not enough to hold the speaker responsible for the resulting harm.<sup>279</sup>

The reason is fairly obvious. When information is published to everyone, it is arguably foreseeable that someone, somewhere, will misuse the information.<sup>280</sup> Thus, if a quantitative expectation of harm were all that mattered, the government could always justify any harm-based regulation of information dissemination to a mass audience. So long as we believe that the First Amendment seeks to encourage publication, this sort of quantitative approach stands the First Amendment on its head.

Accordingly, courts have generally found that the First Amendment prohibits the imposition of criminal or civil liability for distributing or publishing potentially misusable information. When viewers or readers mimicked unlawful or dangerous conduct that had been depicted or described, the courts have refused to impose any liability on the original speaker.<sup>281</sup> Similarly, the First Amendment applies when persons who followed “how-to” instructions suffered allegedly foreseeable injuries,<sup>282</sup> or when written or visual depictions alter persons’ attitudes such that they are more likely to engage in criminal or dangerous behavior.<sup>283</sup>

If the usual First Amendment approach to causation and foreseeability applied to Alice, the government could not hold her responsible for publishing encryption source code merely because it was foreseeable that some recipients might cause harm by misusing it. Existing doctrine focuses primarily on the quality of the causal chain linking the speaker’s conduct to the ultimate harm. For instance, Professor Nimmer has suggested that the government may restrict expressive conduct based on a governmental interest in regulating a non-communicative effect.<sup>284</sup> Yet he qualified that suggestion by referring to the causal link between the speech act and the asserted interest: The conduct must materially and substantially interfere with that interest<sup>285</sup> or be likely to imminently do so.<sup>286</sup> Thus, we can categorize various verbal crimes or torts by the length of the causal chain. With acts like threats or assault, perjury, or criminal fraud, the speech act directly causes the harm. In other words, no third party must act for the harm to occur. In other cases, the speech does not inflict injury. Rather, it inspires or facilitates the receivers’ wrongful acts, such as the incitement in *Brandenberg*.<sup>287</sup>

*NAACP v. Claiborne Hardware*<sup>288</sup> provides an example of the importance of a quality causal chain. At issue was the NAACP’s liability to local merchants for losses caused by a politically motivated boycott.<sup>289</sup> After finding that the First Amendment protected the boycott activity but not

the violence itself,<sup>290</sup> the Court focused on causation by stating that civil liability was available only for losses “proximately caused by unlawful conduct.”<sup>291</sup>

Like *Claiborne Hardware*, the problem with the functionality argument lies in the fact that the causal chain is too long and too speculative. Licensing encryption software exports supposedly protects the government’s interest in conducting signals intelligence abroad by preventing foreign persons from receiving and using U.S. encryption software. The government’s path to the harm follows this doubtful reasoning: (1) Alice publishes her software; (2) foreign persons get and use it; (3) some of these foreign persons are targets of U.S. signals intelligence; (4) U.S. surveillance of these persons is frustrated. Alice’s publication does not “directly” cause the ultimate harm of frustrating U.S. signals intelligence, given the number of links in the causal chain. Moreover, the government would need considerable evidence to establish each link in the chain.<sup>292</sup>

Finally, the functionality approach is especially troubling in that it sweeps all software within its rationale. On the government’s terms, software is functional. The court should thus review such regulation based on an intermediate scrutiny, whether or not the software poses any risk of harm to a government interest. In other words, the government invokes “functionality” to escape the burden of establishing a sound causal chain. Instead of having to actually show that software publication is likely to cause harm, the government only needs to rely on software’s having a “bad tendency.”<sup>293</sup> The First Amendment should not condone such an attempt to circumvent its policy.

## 1. Moral Agency and Intent

The Court is concerned about the quality of the causal chain that leads to the feared harm. In particular, it inquires into how the effects relate causally to the speaker’s act. This seemingly consequentialist concern also includes a concern for moral agency.<sup>294</sup> The functionality approach effaces the role of moral agency by conflating the speaker’s act of saying something with the audience’s act of doing something.

This concern is often understood in terms of intent.<sup>295</sup> Crimes like facilitation, encouragement, and solicitation generally require a showing that the speaker had a sufficiently bad intent that we may impute responsibility for the ultimate act to the speaker.<sup>296</sup> The courts have also imposed a scienter requirement on the arms export control regulations to save them from unconstitutionality.<sup>297</sup> As exemplified by *Claiborne*,<sup>298</sup> moral agency becomes especially important where individuals are punished or disadvantaged for being members of supposedly dangerous groups. In that context, the Court made clear that liability should not apply merely because one belongs to a group with both legal and illegal aims.<sup>299</sup> Liability for association with another should apply only if the individual being sanctioned specifically and clearly intends to further the group’s illegal aims.<sup>300</sup> The flip side of this concern with moral agency and intent is that the government may regulate a

speech act that has become associated with such intent<sup>301</sup> and has a certain force.<sup>302</sup> This is perfectly consistent with the speech-act approach.

## 1. Summary: The Government's Argument Is Flawed

The government's functionality argument is unnecessary and unsound. The government simply wants to prevent certain harms, but existing doctrine already addresses any potential harm caused by speaking. The government's notion of functionality conflicts with the basic principles of causation and moral agency. Functionality-based regulation of encryption software does not even protect the government's interest, as exemplified by the regulation of non-software cryptographic communications as "technical assistance."<sup>303</sup> Simply put, the government uses software's functionality as a ploy to impute responsibility to software speakers for others' possibly harmful acts.<sup>304</sup>

### 1. Functionality and the Level of Scrutiny

Although the formulations are imprecise, an array of doctrines suggests that the government has more leeway to regulate speech on the basis of its non-communicative aspects.<sup>305</sup> Software's functionality could be a "nonspeech element"<sup>306</sup> that warrants lesser scrutiny for regulation of software speech acts. In more contemporary doctrine, in which government purpose is the "threshold consideration,"<sup>307</sup> functionality-based regulation may be content-neutral because it is not based on "communicative impact."<sup>308</sup> Alternatively, the courts may consider the effects associated with software's functionality as "secondary effects," and find any regulation aimed at secondary effects justified without reference to content.<sup>309</sup>

Commentators have criticized these doctrines because the Court seems to have shifted from a catholic view of the dangers of content-based and effect-focused discrimination to a narrower view focused mainly on government purpose.<sup>310</sup> Professor Stone, on the other hand, has argued that content-based discrimination is largely concerned with improper government motivation.<sup>311</sup>

Speech act analysis differs a bit from these views. First, in the software setting, functionality-based regulation is essentially content-based regulation. Second, these various "noncommunicative effects" doctrines pose serious questions about causation and moral agency. Third, concentrating on software speech acts, the distinction between communicative and non-communicative effects only justifies intermediate scrutiny if it is possible to distinguish them from each other in the first place.<sup>312</sup> Because software is always "functional," regulation of software for its functionality proves too much.

### 1. Functionality and the Notion of Content

The government may argue that all software is functional and that functionality-based regulation is not content-based regulation. If the government were right, then such regulation of software would not be subject to strict scrutiny. This subpart argues that functionality is or should be treated as content.<sup>313</sup>

I will begin with the distinctions drawn by the export regulations. The export regulations subject to licensing many technologically-defined categories of items, including hardware, software, and information.<sup>314</sup> In general, however, software and information may be made “publicly available” and thus rendered “not subject to the EAR.”<sup>315</sup> Only two exceptions to the “public availability” exemption exist. First, the EAR does not accord the same treatment to encryption software as it does to other software.<sup>316</sup> Only encryption software requires a license for publication, while all other software subject to export controls does not need such a license. Second, the regulations control cryptographic information differently from other information. For example, providing technical assistance to a foreign person about encryption requires a license.<sup>317</sup>

The regulatory structure demonstrates two things. First, software’s functionality is not an undifferentiated whole. Although the government argues that all software is functional, it excludes only encryption software from public availability on the basis of its functionality. Second, the government is not only targeting the functionality of encryption software. If technical assistance about cryptography that only involves information poses the feared harm, then the government is concerned about effects of cryptographic information that are unrelated to software’s functionality.<sup>318</sup> In short, the EAR initially subjects much software and information to its control, but releases most of it upon publication.

The EAR scheme is thus a more complex version of the situation in *Police Department of Chicago v. Mosley*,<sup>319</sup> where an ordinance banned all peaceful picketing near schools except peaceful school-related labor picketing.<sup>320</sup> Instead of a broad restriction with a narrow exemption, the EAR scheme is a broad restriction with broad “public availability” exemptions. Yet, it has a narrow exception to these broad exemptions. Therefore, the EAR impermissibly targets cryptography as “subject-matter.”<sup>321</sup> The EAR permits computer scientists and programmers to publish algorithms in source code form in any subject, unless the algorithms are cryptographic.<sup>322</sup>

Subject-matter restrictions lie in a gray area between content-based and content-neutral restrictions.<sup>323</sup> At least three distinct themes underlie the general prohibition against content-based discrimination: a preference for more speech,<sup>324</sup> improper government motives,<sup>325</sup> and distortion of public discourse.<sup>326</sup> One commentator has argued that subject-matter restrictions are less likely to distort discourse and to be the product of government hostility toward expressed ideas.<sup>327</sup> He distinguishes, however, between subject-matter restrictions confined to a specific issue<sup>328</sup> and those directed against broad classes of speech by cutting across a wide spectrum of issues.<sup>329</sup> The

former poses a compelling case for content-based scrutiny, while the latter is much closer to genuine content-neutral restrictions.<sup>330</sup>

A limitation based on cryptographic functionality operates as a content-based restriction. First, it only affects discourse about cryptography and thus will distort a narrow range of discourse. In the science community, where knowledge and theories are tested over time, subject-matter prohibitions not only tend to privilege existing viewpoints but also strike at the heart of the scientific method itself. For cryptography, the distortive effects will be even more pronounced. Peer review of encryption source code, in this context, is particularly important because people constantly seek to defeat information security. The discipline advances through sharing knowledge about the strengths and weaknesses of existing technology. Second, the restriction's narrow scope raises the suspicion that the government is discriminating on the basis of viewpoint.<sup>331</sup> The critical question as to motive focuses on whether officials would have adopted the restriction even if the restrictions aimed at speech that the officials supported.<sup>332</sup> Here, the government less stringently regulated its preferred type of encryption, thus indicating a likelihood of official self-interest.<sup>333</sup> Finally, implementing a subject-matter restriction in a highly discretionary administrative licensing scheme enhances the risks of content and viewpoint-based discrimination inherent in such schemes.<sup>334</sup>

Once we move from functionality as a general attribute of software to cryptographic functionality itself, functionality is like content. Regulation based on cryptographic functionality poses the same risks of distorting discourse and inciting improper government motive as do content-based regulations aimed at the subject of cryptography.<sup>335</sup> This is a significant distortion of discourse compared to the distortion that might affect content-based regulation of fighting words.<sup>336</sup>

## 1. **Functionality as a Non-Communicative Aspect or Effect**

The government could counter by arguing that cryptographic functionality is also a non-communicative aspect or effect of software. Arguably, regulation of software speech acts—justified by reference to the harm of using software—is subject only to intermediate scrutiny because such harm is not communicative.<sup>337</sup> The most promising doctrinal paths<sup>338</sup> to intermediate scrutiny lie in the arguments that regulation of functionality aims at either non-communicative impact or secondary effects of software acts.<sup>339</sup>

Yet, these arguments are difficult to maintain for several reasons. First, these doctrines do a poor job of handling the issues of causation and moral agency. The doctrine of secondary effects is the clearest example of slipshod thinking about causation because its value depends on clearly conceptualizing the communicative impact of speaking.<sup>340</sup> Charitably formulated, the doctrine requires merely intermediate scrutiny of regulation aimed at any non-communicative effects that arise from the speech as a physical event in the world.<sup>341</sup> Certain kinds of effects are clearly

primary, not secondary, effects. A listener's reaction to what someone says is not a content-neutral secondary effect.<sup>342</sup> Similarly, harms that arise from listeners' acting on speech are not secondary effects.<sup>343</sup> Yet, the Court has upheld statutes restricting the location of theaters purveying sexually explicit materials—in contrast to theaters showing other types of movies—on the grounds that “adult” movie theaters cause their neighborhoods to deteriorate and become a focus of crime.<sup>344</sup> It is difficult to see how these effects could have been caused by anything other than the viewers' reaction to the content of the adult movies.<sup>345</sup>

Other attempts to clarify the line between primary and secondary effects are equally opaque. In *Boos v. Barry*,<sup>346</sup> Justice O'Connor described the effects in the adult theater cases as almost unique to theaters featuring sexually explicit films<sup>347</sup> and secondary effects as regulatory targets that “happen to be associated with that type of speech.”<sup>348</sup> Hence, the Court's application of the secondary effects doctrine fails to analyze causation logically.<sup>349</sup>

Professor Post concludes that the Court would be better off using Professor Ely's test: whether “the evil the state is seeking to avert is one that is independent of the message being regulated.”<sup>350</sup> A ban on noisy sound trucks is content-neutral if the government bans it because the sound is loud and without regard to meaning. According to this test, ban on heckling that is indifferent to whether the heckling supports or opposes the speaker's viewpoint would also be content-neutral.

On this approach, regulation of only encryption software speech acts is neither clearly content-neutral nor clearly content-based. If the government frames its interest as “frustration of signals intelligence” and only encryption software threatens that interest, then the regulation appears content-neutral. This harm would not flow from a listener's response to the speech act as a speech act. That software can be used to encrypt, however, depends on what the software says. In this sense, the harm is not independent of the message being regulated.

Professor Kagan argues that a broad reading of this secondary effects doctrine errs by allowing courts to merely examine the government motive and to accept the government's pretextual justifications based on non-communicative harms.<sup>351</sup> She suggests that courts use the notion of communicative impact in a quasi-evidentiary role to better test regulations for improper motives.<sup>352</sup> To do so, courts can ask whether the government has tried to regulate the targeted speech acts in the absence of the asserted harm by looking for a “control group” consisting of the same speech but without the supposedly harmful feature.<sup>353</sup> Alternatively, courts can also inquire as to whether the government has regulated non-speech acts that relate to the government interest in the same way.<sup>354</sup>

Applied to encryption software speech acts, however, this approach also yields unclear results. The encryption restrictions probably fail Kagan's “control group” test because, unlike encryption software, other software can be made publicly available.<sup>355</sup> Printed encryption source code may

count as a “control group” of the identical speech that is not regulated at all.<sup>356</sup> The EAR does not fail Kagan’s second test at first glance because it regulates all encryption exports whether or not the export is a speech act.<sup>357</sup> However, it fails that test when it is properly applied<sup>358</sup> because the regulations do not control non-encryption exports of software or technology if the export would make the software or technology “publicly available.”<sup>359</sup> The problem with Kagan’s approach lies in its assumption that speech acts’ non-communicative aspects can be severed from their communicative aspects into a “control group.”<sup>360</sup> This approach can not cope with software speech acts precisely because the non-communicative functionality of a type of software necessarily attaches to any software of that type.

Even if we ignore the secondary effects doctrine, the problem of moral agency infects the non-communicative impact doctrine. The allegedly harmful effects of publishing software are non-communicative in the sense that they occur regardless of whether any particular recipient understands the act as a speech act or whether the actor intended to speak. Harms from the use of software resemble the harm of littering that may attend leafletting.<sup>361</sup> Littering is unrelated to the propositional content of the leafletter’s speech act. From the perspective of moral agency, however, the speaker is restrained because of the potential acts of others.<sup>362</sup> Persons other than the speaker cause the non-communicative impact. Similarly, functionality-based software harm does not arise merely from the speech act itself.

The Court has been wary of restrictions alleged to turn on non-speech aspects of an act but which directly affect one’s ability to speak.<sup>363</sup> In *Cohen v. California*,<sup>364</sup> the Court noted that the conviction was based on “speech” and not on any separately identifiable and non-expressive conduct.<sup>365</sup> When Alice publishes her software, there is also no separately identifiable conduct, whether she publishes it on paper or on the Internet. If Alice’s software has a non-communicative aspect by virtue of its functionality, that aspect flows purely from her choice to speak in a language that people can execute on a computer. That choice facilitates rigorous communication within the community of programmers, and cannot be regulated without effectively repressing her ability to express herself.

Equally important, software’s non-communicative effects cannot be isolated from its communicative effects. Software is associated with these effects because it is written in a language that a person can execute on a computer. It is impossible to publish or communicate software without facilitating these effects. Thus, functionality-based regulation of software speech acts necessarily regulates speaking in programming languages. Neither the secondary effects doctrine nor the notion of non-communicative impact can logically encompass effects that cannot be regulated without regulating the speech itself.

In short, the government seeks to regulate software publication because of the non-communicative effects of the audience members’ potential acts. The First Amendment demands

that every effort be made to avoid regulating publication on this basis.<sup>366</sup> That software has a non-communicative aspect should not lower the level of scrutiny for software speech acts. Courts should consider speech acts as a whole because the Court has rejected attempts to subdivide them into their “component parts.”<sup>367</sup> Accordingly, regulating publication of encryption software for its cryptographic functionality must be tested under standard strict scrutiny.

## 1. Conclusion

Software poses no special First Amendment problems if we resist the impulse to treat speech as a thing. Most of the problems that seem to plague First Amendment coverage of software become tractable once we focus on software acts instead of software *per se*. Some software acts are speech acts, while others are not. *Bernstein* presents a case of a speech act covered by the First Amendment. Professor Bernstein’s intended publication of his software is a speech act because it is one within the speech sub-community of computer science.

In the realm of software acts that are speech acts, standard First Amendment doctrine provides the tools needed to cope with the risks of harm that might be caused by someone’s use of software. By contrast, the government’s proffered “functionality” doctrine ignores traditional concerns about causation and moral agency by not distinguishing the acts of the speaker and the hearer.

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1 . Donald E. Knuth, *Literate Programming* ix (1992).

2 . Programmers normally write software in high-level programming languages like C; in this form, the software is source code. Source code isn’t directly executable by a computer; the software that people buy at computer stores is in a form called object code. “A special program is used to translate the human-readable source code into computer-readable object code. If the program has been written in a high-level language like C, the program is called a compiler.” Andrew Johnson-Laird, *Software Reverse Engineering in the Real World*, 19 U. Dayton L. Rev. 843, 859 (1994).

3 . By “publish” I mean making a work of expression generally available to the public, whether in a book, a journal article, or on the Internet.

4 . 176 F.3d 1132 (9th Cir. 1999) (affirming district court decision that export regulations on encryption items are unconstitutional) [hereinafter *Bernstein IV*], *withdrawn pending en banc reh’g*, 192 F.3d 1308 (9th Cir. 1999), *appeal dismissed without prejudice and remanded*, No. 97-16686 (9th Cir. Apr. 11, 2000). Professor Bernstein wrote his

encryption program, named Snuffle, while he was a graduate student in mathematics at the University of California at Berkeley. For further background, see *Bernstein v. United States Dep't of State*, 974 F. Supp. 1288 (N.D. Cal. 1997) [hereinafter *Bernstein III*]; *Bernstein v. United States Dep't of State*, 945 F. Supp. 1279 (N.D. Cal. 1996) [hereinafter *Bernstein II*]; *Bernstein v. United States Dep't of State*, 922 F. Supp. 1426 (N.D. Cal. 1996) [hereinafter *Bernstein I*]. *Bernstein I* and *Bernstein II* challenged the encryption export control provisions of the International Traffic in Arms Regulations (“ITAR”), promulgated under the Arms Export Control Act, Pub. L. No. 90-629, 82 Stat. 1320 (codified as amended in scattered sections of 22 U.S.C. (1994)). After *Bernstein II*, the President shifted licensing authority for encryption exports to the Commerce Department. See Executive Order No. 13,026, 61 Fed. Reg. 58,767 (1996); 61 Fed. Reg. 68,572 (1996). In *Bernstein III*, the district court held the Commerce Department’s encryption Export Administration Regulations (“EAR”), which were constitutionally indistinguishable from the ITAR with respect to encryption, unconstitutional. On January 14, 2000, the Commerce Department promulgated a new version of the encryption EAR, which is beyond the scope of this Article. On April 11, 2000, the Ninth Circuit remanded the case to the district court for consideration in light of the new regulations.

5 . Roughly the same issues were presented in two other cases in two other circuits. See *Junger v. Daley*, 8 F. Supp. 2d 708 (N.D. Ohio 1998) (finding export regulations constitutional), *rev'd and remanded*, No. 98-4045, 2000 U.S. App. LEXIS 6161 (6th Cir. Apr. 4, 2000); *Karn v. United States Dep't of State*, 925 F.Supp. 1 (D.D.C. 1996), *remanded*, 107 F.3d 923 (D.C. Cir. 1997). For a discussion of the various cases, see generally Think Nguyen, Note, *Cryptography, Export Controls, and the First Amendment in Bernstein v. United States Department of State*, 10 Harv. J.L. & Tech. 667 (1997) (focusing on *Bernstein*); Laura M. Pilkington, Comment, *First and Fifth Amendment Challenges to Export Controls on Encryption: Bernstein and Karn*, 37 Santa Clara L. Rev. 159 (1996); Daniel R. Rua, Comment, *Cryptobabble: How Encryption Export Disputes Are Shaping Free Speech for the New Millennium*, 24 N.C. J. Int'l L. & Com. Reg. 125 (1998). As this Article went to press, the Sixth Circuit held that source code, “though unintelligible to many,” is protected by the First Amendment because it “is the preferred method of communication among computer programmers” and “is an expressive means for the exchange of information and ideas about computer programming.” *Junger v. Daley*, No. 98-4045, 2000 U.S. App. LEXIS 6161, at \*10 (6th Cir. Apr. 4, 2000).

6 . For a detailed discussion of the regulations, see Rua, *supra* note 5, 139-44.

7 . The Supreme Court evaluates administrative pre-publication licensing schemes as a form of prior restraint under the First Amendment. See, e.g., *FW/PBS, Inc. v. City of Dallas*, 493 U.S. 215 (1990) (holding a licensing provision unconstitutional under the First Amendment for lack of procedural safeguards); *City of Lakewood v. Plain Dealer Publ'g Co.*, 486 U.S. 750, 759 (1988) (holding newsrack licensing scheme facially unconstitutional because mayor had too much discretion); *Freedman v. Maryland*, 380 U.S. 51, 58-60 (1965) (finding movie licensing scheme aimed at screening out obscene movies unconstitutional because licensor had too much discretion); *Lovell v. Griffin*, 303 U.S. 444, 447 (1938) (reversing conviction of Jehovah’s Witness for distributing pamphlets in violation of ordinance requiring permit prior to distributing “literature of any kind”).

8 . The export regulations controlled encryption programs, but not one-way hash functions. Thus, many one-way hash functions were publicly available. As a mathematical matter, however, one-way hash functions can be used to encrypt, and Professor Bernstein’s Snuffle program was written to do precisely that. He thus sought to demonstrate that the regulatory distinction between encryption software and one-way hash functions was “absurd.” See *Bernstein IV*, 176 F.3d at 1141 n.14 (“Snuffle was intended, in part, as political expression”); *id.* at 1135-1136 n.1 (explaining “hash function”).

- 9 . Robert Post, *Recuperating First Amendment Doctrine*, 47 Stan. L. Rev. 1249, 1250 (1995).
- 10 . See, e.g., Frederick Schauer, *Categories and the First Amendment: A Play in Three Acts*, 34 Vand. L. Rev. 265, 267-68 (1981).
- 11 . See Donald Knuth, *Selected Papers in Computer Science 2* (1996).
- 12 . See, e.g., Laurent Siklossy, *Let's Talk LISP* (1976) (containing functions written in LISP programming language); MIT Press, *Complete Code from SICP Second Edition*, <http://mitpress.mit.edu/sicp/code/index.html> (visited April 9, 2000) (listing sections of code from the influential book, Harold Abelson et al., *Structure and Interpretation of Computer Programs* (1984)).
- 13 . I focus on source code, the conventional form in which software is published for study and criticism. See *Bernstein IV*, 176 F.3d at 1141. But programmers also can and do read object code. See Anthony L. Clapes, *Confessions of an Amicus Curiae: Technophobia, Law, and Creativity in the Digital Arts*, 19 Dayton L. Rev. 903, 941 (1994). As a practical matter, distinguishing source code from object code for First Amendment purposes appears largely pointless. One need merely compile source code to produce object code, so publishing source code effectively makes the object code available as well. It's therefore hard to see how any government interest would likely be furthered by regulating the publication of object code when the source code can be published.
- 14 . I assume that acts like publishing an article in *Scientific American* are "high-value speech" covered and protected by the First Amendment. See Roy Spece, Jr. & Jennifer Weinzierl, *First Amendment Protection of Experimentation: A Critical Review and Tentative Synthesis/Reconstruction of the Literature*, 8 S. Cal. Interdis. L.J. 185, 187 (1998). But see Gary L. Francione, *Experimentation and the Marketplace Theory of the First Amendment*, 136 U. Pa. L. Rev. 417 (1987) (noting that noncommunicative experimentation may be regulated on rational basis test if government does not intend to suppress communication).
- 15 . Academic freedom is "a special concern of the First Amendment." *Keyishian v. Board of Regents*, 385 U.S. 589, 603 (1967). See also *Sweezy v. New Hampshire*, 354 U.S. 234, 250 (1957) (noting that "[t]eachers and students must always remain free to inquire, to study and to evaluate, to gain new maturity and understanding").
- 16 . Even though a plaster bust of Martin Luther King, Jr. is "speech," that doesn't mean that distributing the sculpture can't be regulated. Cf. *Martin Luther King, Jr., Center for Social Change, Inc. v. American Heritage Products, Inc.*, 296 S.E.2d 697 (1982) (King estate wins right of publicity case against sculpture distributor).
- 17 . Which isn't what the Supreme Court asks. See *Hurley v. Irish-American Gay, Lesbian and Bisexual Group of Boston*, 515 U.S. 557, 568 (1995).
- 18 . For other applications of speech-act theory to First Amendment law, see Peter Tiersma, *Nonverbal Communication and the Freedom of "Speech,"* 1993 Wis. L. Rev. 1525 (1993); Lawrence Solum, *Freedom of Communicative Action: A Theory of the First Amendment Freedom of Speech*, 83 Nw. U. L. Rev. 54 (1989) (relying on Jürgen Habermas's theory of communicative action); Kent Greenawalt, *Speech and Crime*, 1980 Am. B. Found. J. 645. I don't use "speech acts" to denote what the Court has called "verbal acts." See *Gompers v. Bucks Stove & Range Co.*, 221 U.S. 418, 439 (1911).

- 19 . Cf. Post, *supra* note 9, at 1254; Robert Post, *Community and the First Amendment*, 29 Ariz. St. L. J. 473, 481 (1997) (“Within the realm of discourse, one might say, there is not merely a marketplace of ideas; there is also a marketplace of communities.”); Robert Post, *Reply to Bender*, 29 Ariz. St. L.J. 495 (1997).
- 20 . Thus, sculpture is “speech” because “doing art” is a recognized speech practice, and “doing” sculpture is a way of doing art. Whether one uses oils on canvas or plaster is irrelevant. What matters is that one is “doing art,” in terms of art practices and conventions. *See generally* Howard Becker, *Art Worlds* (1982). For a similar argument, *see* Joshua Waldman, Note, *Symbolic Speech and Social Meaning*, 97 Colum. L. Rev. 1844 (1997) (courts analyze expressiveness of conduct in terms of traditional social meaning of conduct’s categories).
- 21 . I assume that the central justification for regulating speech acts is the harm they might cause, and I therefore will not discuss any First Amendment theory of what harms count.
- 22 . In those situations, it’s usually said that while agreeing to participate or assist in doing an unlawful act is usually accomplished through “speech,” the larger course of conduct in which that speech is integrated overrides any potential First Amendment applicability.
- 23 . Frederick Schauer’s is the most comprehensive. *See generally* Schauer, *supra* note 10.
- 24 . *See* Post, *supra* note 9, at 1271.
- 25 . *See id.*
- 26 . U.S. Const. amend. I; *see* Melville Nimmer, *The Meaning of Symbolic Speech Under the First Amendment*, 21 U. C.L.A. L. Rev. 29, 36 (1973). He was guided by speech-act theory. *See id.* at 36 n.33.
- 27 . The critic may argue that I’ve substituted for “values” a particular definition of “speaking,” probably a fair point. But my constraints are based on “speech acts” as normative social phenomena, not on a full-blown theory about First Amendment values. Put another way, I begin with communication and then freedom of speech, not the other way around.
- 28 . *See, e.g.*, Nimmer, *supra* note 26, at 36.
- 29 . Cf. *id.* at 37 (“symbolic speech requires not merely that given conduct results in a meaning effect, but that the actor causing such conduct must intend such a meaning effect by his conduct”).
- 30 . Later I’ll explain what I think is necessary for it to be the case that we do, in fact, have such a practice. *See infra* text accompanying notes 5592-.
- 31 . Cf. Waldman, *supra* note 20, at 1851 (arguing that while courts have focused on the actor’s actual intent as the primary element of the *Spence* test, its relevance is minimized by the second element, audience-understanding). An important caveat here is that my analysis is directed to particular speech acts, in theory. I’m not suggesting that courts should or need to do coverage analysis in every case by asking whether the particular actor intended to

communicate, any more than courts should or need to ask whether the particular utterance at issue “really” meant what it means in the relevant language. Most of the time, it is clear in the total situation that both utterance meaning or a meaning-substitute and speaker’s intent exist, because of the operative background conventions.

32 . Post, *supra* note 9, at 1252.

33 . J. L. Austin, *How To Do Things With Words* 147 (1962).

34 . *See Texas v. Johnson*, 491 U.S. 397, 405 (1989).

35 . Illocutionary act is the term given to a complete speech act. *See* John R. Searle, *Speech Acts* 23 (1969).

36 . *See Austin, supra* note 33, at 105.

37 . Propositional content corresponds to the meaning of the utterance, what it refers to or predicates. *See Searle, supra* note 35, at 23-24.

38 . Illocutionary acts should be distinguished from perlocutionary acts, which are defined by the effect they have on the listener. *See Austin, supra* note 33, at 102.

39 . *See Searle, supra* note 35, at 23.

40 . For the interested reader, Austin describes speech act theory in Austin, *supra* note 33. Searle refined and extended Austin’s insights in a general theory within which descriptive or representative uses of language are merely one class of speech act. *See generally* John R. Searle, *Intentionality* (1983); John R. Searle, *Expression and Meaning* (1985); Searle, *supra* note 35 .

41 . *See Searle, supra* note 35, at 24.

42 . Austin, *supra* note 33, at 1 n.1.

43 . Searle, *supra* note 35, at 29 (emphasis added).

44 . *See id.* at 23-24.

45 . Searle, *Intentionality, supra* note 40, at 161.

46 . *See id.* at 163.

47 . *United States v. O’Brien*, 391 U.S. 367 (1968).

48 . *See id.* at 369-70.

49 . Searle, *Intentionality*, *supra* note 40, at 164.

50 . On this approach, insincerity doesn't directly affect the status of an utterance as a threat. I may not really mean you harm. What matters is whether you fairly take what I say as a threat. A practical joke threat is still a threat because the practical joker intends that the victim take it as a threat—the practical joker's intention is not satisfied if the victim takes it as a joke. In addition, the category of "true threat" generally is defined by reference to perlocutionary effects, like getting someone to do or not do something, and usually the threatener intends to produce that perlocutionary effect. Thus a threat is usually also a perlocutionary act.

51 . *See* Searle, *Intentionality*, *supra* note 40, at 165 ("Characteristically a man who makes a statement both intends to represent some fact or state of affairs and intends to communicate this representation to his hearers."). The same analysis applies to speech acts that aren't assertives, although here we wouldn't speak of intent to represent but rather the correlative illocutionary intent.

52 . *Id.* at 166. Thus, I can make a statement about how things are with varying communication intentions, even though in every case I'll have the same representing intention. I might intend that a hearer believe my statement or I might not. Indeed, I might not even really intend that a hearer understand me; I might be indifferent to the possibility. I might be a salesperson uttering legalese about warranties and disclaimers, or a police officer reading someone his *Miranda* rights. But even though the hearer might not actually understand the legal mumbo-jumbo, and even if the speaker really doesn't want the hearer to understand it, the speaker doesn't lack the communication intention the way Searle's accidental arm-raiser does. The speaker still intends the act as a speech act.

53 . Searle, *Intentionality*, *supra* note 40, at 168.

54 . As Tiersma argues, a "joking" offer is usually still an offer because the point of the joke turns on the offeree's believing that the offer is real. Only when under the circumstances it couldn't reasonably be believed that the offer is real does the joking offer not count as an offer. *See* Peter Meijes Tiersma, Comment, *The Language of Offer and Acceptance: Speech Acts and the Question of Intent*, 74 Calif. L. Rev. 189, 227 (1986).

55 . *See* Tiersma, *supra* note 18, at 1557-58; Waldman, *supra* note 20, at 1864-67. There will always be borderline or contested cases. I don't put too much weight on how widely a convention is accepted. When the American colonists dumped tea into Boston Harbor as an act of protest against British taxes, that was clearly a speech act, even if there had never been a prior act of protesting by means of dumping tea (damaging property has long been a means of protest, I assume). My general claim is that what is important about language is that it is conventional, and as such language is only one of many systems of conventions that can supply the needed conventionality.

56 . *See* David Lewis, *Languages and Language*, in 1 *Philosophical Papers* 164-66 (1983).

57 . *See* *Dambrot v. Central Michigan University*, 55 F.3d 1177, 1188 (6th Cir. 1995) ("The purpose of the free speech clause . . . is to protect the market in ideas, broadly understood as the public expression of ideas . . . to an audience whom the speaker seeks to inform, edify, or entertain.").

58 . The philosopher Charles Taylor realized that communities themselves are largely defined by a shared language convention. See Charles Taylor, *Human Agency and Language* 234 (1985). Taylor explains that

[i]f language must be primarily seen as an activity . . . then it becomes relevant to note that the primary locus of speech is in conversation. Men speak together, to each other. Language is fashioned and grows not principally in monologue, but in dialogue, or better, in the life of the speech community. . . . The language I speak . . . can never be just *my* language, it is always largely *our* language. . . . [I]t is not just the speech community which shapes and creates language, but language which constitutes and shapes the speech community.

*Id.*

59 . Such conventions include traditions. For discussion of the role of tradition in musical worlds (in the context of a very different kind of argument), see generally Sanford Levinson & J.M. Balkin, *Law, Music, and Other Performing Arts*, 139 U. Pa. L. Rev. 1597 (1991) [hereinafter Levinson & Balkin, *Law, Music*]; J.M. Balkin & Sanford Levinson, *Hermeneutic: Interpreting Law and Music: Performance Notes on “The Banjo Serenader” and “The Lying Crowd of Jews,”* 20 Cardozo L. Rev. 1513 (1999) [hereinafter Balkin & Levinson, *Hermeneutic*].

60 . Thus, Balkin and Levinson claim that the issue of musical authenticity isn’t about the performer’s relationship to the text or score, but “to other people . . . to some form of community, whether past or present,” or “the authority of a tradition or a culture and, hence, to their embodiment in some community.” Balkin & Levinson, *Hermeneutic*, *supra* note 59, at 1544.

61 . Most people, I think, do not really doubt that when Alice writes and publishes her program, she is genuinely engaging in First Amendment activity from at least one perspective, that of “science.” What computer scientists or engineers do is like what mathematicians or physicists do. So I’ll assume, for now, that at some level of abstraction Alice’s actions are covered by the First Amendment as much as scientific research and publication in general. This doesn’t eliminate act-characterization questions that are generic to the First Amendment status of “science,” of course.

62 . See Post, *supra* note 9, at 1253-54.

63 . See *id.*

64 . The “resources and advantages” at issue in this larger social world include First Amendment coverage and intellectual property protection for art. See generally Becker, *supra* note 20, at 165-91 (discussing art and the state).

65 . See Balkin & Levinson, *Hermeneutic*, *supra* note 59, at 1541 (“For performers who inhabit an ongoing tradition, the authenticity of performance is assured by living and working within the tradition.”).

66 . Becker notes, for example, that Duchamp’s urinal, “whose only claim to being art apparently lay in Duchamp’s signature on them,” “outrage[d] both commonsense and finer sensibilities.” Becker, *supra* note 20, at 146-47. But after these works “gained great renown in the world of contemporary visual art,” aestheticians developed the “institutional theory” of art to include Duchamp’s work. *Id.*

67 . *Id.* at 155.

68 . *Id.* at 134; *see also* Balkin & Levinson, *Hermeneutic*, *supra* note 59, at 1545 (“People use the notions of authenticity or fidelity both to define themselves with respect to the practice and to define and regulate the practice.”).

69 . Artists often challenge prevailing ideas about art, of course. But this doesn’t diminish the role of aesthetics. As Becker notes: “Among the things [artists] keep in mind in making the innumerable small decisions that cumulatively shape the work is whether and how those decisions might be defended. Of course, working artists do not refer every small problem to its most general philosophical grounding to decide how to deal with it, but they know when their decisions run afoul of such theories, if only through a vague sense of something wrong.” Becker, *supra* note 20, at 133.

70 . An “existing aesthetic needs to be kept up to date so that it continues to validate logically what audiences experience as important art work and thus to keep alive and consistent the connection between what has already been validated and what is now being proposed.” Becker, *supra* note 20, at 138. *Cf.* Post, *Community*, *supra* note 19 , at 481 (“For public discourse to provide a site for autonomous decisionmaking, it must itself remain perennially open-ended, perpetually subject to revisional experimentation.”).

71 . *See generally* Becker, *supra* note 20, at 300-50 (discussing “how art worlds change,” with emphasis on “how changes find an organizational base and thus last”).

72 . *See* Post, *supra* note 9, at 1253.

73 . *See* Austin, *supra* note 33, at 101.

74 . *See* Spence v. Washington, 418 U.S. 405, 406-08 (1974).

75 . *See id.* at 414-15.

76 . *Id.* at 410.

77 . *Id.* at 410-11.

78 . 515 U.S. 557 (1995).

79 . *See id.* at 566.

80 . *Id.* at 568, 570.

81 . *See id.* at 569.

82 . *Id.*

83 . *Id.*

84 . I'm chiefly concerned with the aspect of meaning known as "sense." Philosophers distinguish *Sinn* and *Bedeutung*, or sense and reference. Sense denotes, roughly, public meaning, what John Locke called "common acceptation," how a word is commonly used. When I refer to Julius Caesar, it is publicly established that I mean a specific Roman emperor. See Ian Hacking, *Why Does Language Matter to Philosophy?* 46-51 (1975).

85 . *Dallas v. Stanglin*, 490 U.S. 19, 25 (1989).

86 . See Lawrence Alexander & Paul Horton, *The Impossibility of a Free Speech Principle*, 78 Nw. U. L. Rev. 1319, 1322 (1984) ("[A]n audience can derive meaning from all sorts of human and natural events.").

87 . *Joseph Burstyn, Inc. v. Wilson*, 343 U.S. 495, 501 (1952) (finding movies covered by the First Amendment and overruling *Mutual Film Corp. v. Industrial Comm'n*, 236 U.S. 230 (1915)). Although the Court didn't speak of coverage versus protection, it's clear that its holding went to coverage. See 343 U.S. at 501 ("it is urged that motion pictures do not fall within the First Amendment's aegis.").

88 . Alexander & Horton, *supra* note 86, at 1330 (criticizing Schauer for implying that "[i]f government forbade [him] to view the Matterhorn in order to prevent him from being awed by it . . . this government regulation would fall within the jurisdiction of his Free Speech Principle") (footnote omitted).

89 . Post, *supra* note 9, at 1252 ("[T]he doctrine is transparently and manifestly false" because "any action can at any time be made communicative in a manner that satisfies the *Spence* test," like "the racist who commits a violent crime successfully to communicate a message of racial prejudice and hate.") (footnote omitted).

90 . *United States v. O'Brien*, 391 U.S. 367, 376 (1968).

91 . *But see* Waldman, *supra* note 20, at 1856 (arguing that the Court doesn't really care about an actor's actual intent).

92 . One practical reason, then, for presuming linguistic acts to be speech acts is that actors who perform linguistic acts are likely to be intending to communicate.

93 . Tiersma gives the example of a person who coughs in our presence. We would infer that this person is sick. But the person didn't speak that fact. See Tiersma, *supra* note 18, at 1554.

94 . As I've already argued, speaker's intent should be understood as the intent that goes with the illocutionary act. Illocutionary intent is intersubjective because we recognize illocutionary force through our knowledge of a common language or shared conventions.

95 . There's no inherent reason why recreational dancing couldn't be a kind of speech that lacks a particularized

message and instead appeals to a “meaning substitute,” as art or music does. But when people dance recreationally, they don’t obviously intend to communicate. For many other kinds of dancing, we do recognize intent to communicate. Classical ballet and modern dance are quite conventional. Ceremonial or ritual dancing has communicative intent in a different way, but it is still intended to communicate. The performing arts in general appeal to the subset of convention typically known as “tradition.” *See generally* Balkin & Levinson, *Hermeneutic, supra* note 59 (discussing the analogy between law and the performing arts); Waldman, *supra* note 20, at 1876-77 (contrasting views of barroom nude dancing as unlike operatic-type nude dancing or as “part of the ‘ancient art’ of performance dance” (footnote omitted)).

96 . *See* Spence v. Washington, 418 U.S. 405, 410 (1974); *accord* Texas v. Johnson, 491 U.S. 397, 404-05 (1989).

97 . Buckley v. Valeo, 424 U.S. 1, 44, 79-80 (1976).

98 . *See id.* at 43-44.

99 . *Id.* at 44 n.52. Some of these magic words include: “vote for,” “elect,” “support,” “cast your ballot for,” “Smith for Congress,” “vote against,” “defeat,” and “reject.” *Id.*

100 . FEC v. Massachusetts Citizens for Life, Inc., 479 U.S. 238, 249 (1986) (finding that an anti-abortion group’s newsletter “provides . . . an explicit directive: vote for these (named) candidates”).

101 . *See* Lemon v. Kurtzman, 403 U.S. 602, 612-13 (1971) (laying out the three-pronged test).

102 . Wallace v. Jaffree, 472 U.S. 38, 60-61 (1985) (citation omitted). I deliberately ignore here the questions related to “government speech;” my point is simply that the Court has viewed government conduct as a potential speech act.

103 . 465 U.S. 668 (1984).

104 . *Id.* at 691 (O’Connor, J., concurring).

105 . *Id.* at 690.

106 . *Id.* at 690.

107 . 492 U.S. 573 (1989).

108 . *See id.* at 580.

109 . *See id.* at 595, 597 (noting that the general principles of O’Connor’s framework from her *Lynch* concurrence are “sound,” and “have been adopted by the Court in subsequent cases”).

110 . *Id.* at 595 (quoting *Lynch v. Donnelly*, 465 U.S. 668, 692 (1984) (O’Connor, J., concurring)).

111 . *Id.* (quoting *Lynch*, 465 U.S. at 692 (O'Connor, J., concurring)).

112 . *Id.* at 598. In contrast, the crèche display in *Lynch* included “Santa’s house and his reindeer” and a “‘talking’ wishing well” as “separate” visual focal points. *Id.*

113 . *Id.* at 614 (quoting *Lynch*, 465 U.S. at 692 (O'Connor, J., concurring)).

114 . *See id.* at 617-20. Neither the purpose nor entanglement prong of *Lemon* was before the Court.

115 . *See supra* note 8 and accompanying text.

116 . *See, e.g.,* *Karn v. United States Dep’t of State*, 925 F. Supp. 1, 9 n.19 (D.D.C. 1996), *remanded* 107 F.3d 923 (D.C. Cir. 1997) (“The Court makes no ruling as to whether source codes, without the comments, fall within the protection of the First Amendment. Source codes are merely a means of commanding a computer to perform a function.”).

117 . *See* 15 C.F.R. § 734.3(b)(3) note (1996).

118 . One might therefore wonder whether using a fax machine or “Web cam” to transmit a hand-scrawled copy of encryption source code is an electronic export. The transmission medium is electronic, but no one could “directly” input the received copy into a computer for execution. The same is true of various digital formats for pictures or graphics like GIFs, JPEGs, or PDF and Postscript files, the rough electronic equivalent of a photograph.

119 . For instance, oral speech acts are necessarily audible. We can use loudness for meaning, as when we emphasize a particular word, or for disturbance, as when we loudly heckle.

120 . A printed pamphlet has communicative effect when read, but a noncommunicative effect when crumpled and tossed on the sidewalk.

121 . *Metromedia, Inc. v. City of San Diego*, 453 U.S. 490, 501 (1981).

122 . For example, 15 and 28 are relatively prime because they share no common factors other than 1. However, 15 and 27 are not relatively prime because both are divisible by 3.

123 . *See* Bruce Schneier, *Applied Cryptography: Protocols, Algorithms, and Source in C* 245-48 (Phil Sutherland ed., 2d ed. 1996).

124 . Euclid, *Elements*, bk. VII, proposition 2, *available at* D.E. Joyce, *Euclid’s Elements*, <http://aleph0.clarku.edu/~djoyce/java/elements/bookVII/propVII2.html> (visited Apr. 26, 2000). Please note that the lines are not to scale.

125 . *See* Mr. Abdelnour, *Unit 4: Programming Techniques*, <http://www.blueskies.net/abdelnou/dcco6d/lessons/less6-u4.htm> (visited Apr. 9, 2000).

126 . The procedure in Example (2) works for 15 and 27 as follows: divide 15 into 27, with remainder 12; now divide 12 into 15, with remainder 3; now divide 3 into 12, which divides exactly, so the remainder is 0. Thus, 3 is the greatest common divisor of 15 and 27.

127 . See Dorothy E. Denning, *Cryptography and Data Security* 44 (1983).

128 . See Schneier, *supra* note 123, at 245.

129 . See, e.g., Marci A. Hamilton & Ted Sabety, *Computer Science Concepts in Copyright Cases: The Path to a Coherent Law*, 10 Harv. J.L. & Tech. 239, 239 n.1 (1997) (“[A] program is the sequence of instructions that are executed by the computer when it performs a desired task.”).

130 . Professor Schauer, for example, is dubious that “how-to” instructions that accompany products are covered by the First Amendment. He gives the example of a chainsaw manufacturer who provides instructions on how to remove the chainsaw’s safety devices, but explaining that the safety devices should only be removed by a trained mechanic for testing purposes after repair. A consumer removes the devices and a bystander is injured. In his opinion, the chainsaw manufacturer cannot successfully raise a First Amendment defense. See Frederick Schauer, *Mrs. Palsgraf and the First Amendment*, 47 Wash. & Lee L. Rev. 161, 164-66 (1990) (“We would say not that instructions are less protected by the First Amendment (which would mean that every instruction case still must be tested against a first amendment-inspired set of doctrinal rules) but that they are not covered at all.”).

131 . See, e.g., Knuth, *supra* note 11, at 96-108 (surveying a number of mathematical algorithms that a non-mathematician cannot comprehend).

132 . When a program is clean and neat, nicely structured and consistent, it can be beautiful. I guess I wouldn’t compare a program with the Mona Lisa, but a good program does have a simplicity and elegance that’s quite handsome. Stylistic distinctions of different programs are intriguing, very much like the differences art critics might see between Leonardo’s Mona Lisa and a Van Gogh. I like the LISP programming language because it’s so pleasing. There’s a concise form of LISP called the M expressions. When you write an algorithm using M expressions, it’s so beautiful you almost feel it could be framed and hung on a wall.

Susan Lammers, *Programmers At Work* 64 (1986) (quoting Gary Kildall, author of CP/M, a principal early operating system). See also Frederick P. Brooks, *The Mythical Man-Month* 7 (1975) (“The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination. Few media of creation are so flexible, so easy to polish and rework, so readily capable of realizing grand conceptual structures. . . . Programming then is fun because it gratifies creative longings built deep within us and delights sensibilities we have in common with all men.”).

133 . See *Bernstein I*, 922 F. Supp. 1426, 1435 (N.D. Cal. 1996) (quotation and citation omitted); see also Robert X. Cringely, *Accidental Empires: How the Boys of Silicon Valley Make Their Millions, Battle Foreign Competition, and Still Can’t Get a Date* 28 (1992) (“Programs are written in a code that’s referred to as a computer language, and that’s just what it is—a language, complete with subjects and verbs and all the other parts of speech we used to be able to name back in junior high school. Programmers learn to speak the language, and good programmers learn to

speak it fluently. The very best programmers go beyond fluency to the level of art, where, like Shakespeare, they create works that have value beyond that even recognized or intended by the writer.”).

134 . See Hamilton & Sabety, *supra* note 129, at 265-66 (explaining that programming languages are “composed of a set of grammar rules and a set of symbols” and that, unlike natural languages, the grammar of typical programming languages is “context-free” thus enabling a computer to check grammar mechanically without knowing what the symbols mean) (footnotes and citations omitted).

135 . See Donald Knuth, *The Art of Computer Programming: Fundamental Algorithms 5* (1st ed. 1968) (“Each step of an algorithm must be rigorously and unambiguously specified for each case. The algorithms in this book will hopefully meet this criterion, but since they are specified in English, there is a possibility that reader might not understand exactly what the author intended.”).

136 . 403 U.S. 15 (1971).

137 . See *id.* at 16.

138 . See *id.* at 24-25.

139 . See *Hurley v. Irish American Gay, Lesbian and Bisexual Group of Boston*, 515 U.S. 557, 573 (1995) (“[T]he fundamental rule of protection under the First Amendment [is] that a speaker has the autonomy to choose the content of his own message.”); *Riley v. National Federation of the Blind of N.C., Inc.*, 487 U. S. 781, 790-91 (1988) (“The First Amendment mandates that we presume that speakers, not the government, know best both what they want to say and how to say it.”); *Meyer v. Grant*, 486 U. S. 414, 424 (1988) (“The First Amendment protects [individuals’] right not only to advocate their cause but also to select what they believe to be the most effective means for so doing . . .”).

140 . See Hamilton & Sabety, *supra* note 129, at 280 (“[T]here are many cases of one programmer making an improvement to another’s existing algorithm.”).

141 . A simple example lies in algorithms that solve the problem of information retrieval, such as a telephone number in a directory.

142 . See Knuth, *Selected Problems In Computer Science* 61-78 (discussing sequential search, binary search, and other search algorithms).

143 . See *id.* at 12 (“[T]he study of algorithms themselves has opened up a fertile vein of interesting new mathematical problems.”).

144 . Some mathematical functions that are simple to compute in one direction but extremely difficult in the other direction are the basis of important cryptographic algorithms. Euclid’s algorithm, discussed *supra* text accompanying note 124, is an example of an algorithm related to such hard problems. The hard problem to which Euclid’s algorithm applies is that of factoring large numbers, i.e., to find the prime numbers that when multiplied yield that number. Computers can quickly multiply two very large prime numbers of 100 digits. But taking the product of that

multiplication and factoring it to recover the two prime factors requires much more computing power. *See* Schneier, *supra* note 123, at 245.

145 . *See, e.g.*, Thomas Emerson, *Colonial Intentions and Current Realities of the First Amendment*, 125 U. Pa. L. Rev. 737, 741 (1977) (noting that a theory of marketplace of ideas “is essentially the method of science,” which seeks “progress through free and rational inquiry”).

146 . Schneier Decl., ¶ 34, Appellee’s Excerpts of Record, vol. 1, *Bernstein v. United States Dep’t of Justice*, 176 F.3d 1132 (9th Cir. 1999) (No. 97-16686) (“Source code is an especially important dissemination tool because it is exact . . . [and] not subject to interpretation. Cryptographers often publish ‘reference implementations’ of their algorithms. These are meant to be benchmarks against which other implementations are verified. If a cryptographer wants to study an algorithm, he often tests his own code against the reference implementation to ensure that the implemented the algorithm correctly.”).

147 . *See* Post, *supra* note 9, at 1254 (“[S]ocial conventions, to serve the values protected by the First Amendment, must do more than merely facilitate the communication of particularized messages. They must at a minimum also presuppose and embody a certain kind of relationship between speaker and audience. We might roughly describe that relationship as dialogic and independent.”).

148 . *See* Francione, *supra* note 14, at 425 (“[S]cientific publications would ordinarily be protected by first amendment rights to publish.” (quoting John A. Robertson, *The Scientist’s Right to Research: A Constitutional Analysis*, 51 S. Cal. L. Rev. 1203, 1217 (1978))).

149 . *See, e.g.*, R. Polk Wagner, Note, *The Medium is the Mistake: The Law of Software for the First Amendment*, 51 Stan. L. Rev. 387, 407 (1999) (“[S]oftware, to the extent it can be considered a set of instructions, communicates only to machines”).

150 . *See* Knuth, *supra* note 11, at 2-5 (“A computer program is a representation of an algorithm in some well-defined language. Algorithms are abstract computational procedures for transforming information; programs are their concrete embodiment . . . . My favorite way to describe computer science is to say that it is the study of algorithms.”).

151 . *But see* Lars Noah, *Authors, Publishers, and Products Liability*, 77 Or. L. Rev. 1195, 1207-08 (1998) (“I daresay that few cookbooks are read while relaxing at the beach; instead, they are used in the kitchen while preparing a meal.”); Jonathan Mintz, *Strict Liability for Commercial Intellect*, 41 Cath. U. L. Rev. 617, 645 (1992) (explaining that consumers expect recipes “to be directly usable . . . rather than . . . capable of being read and contemplated as information for information’s sake”).

152 . The most obvious example is computer science textbooks, which commonly contain sample programs for students to study. An example in the field of cryptography is Schneier, *supra* note 123 (containing numerous algorithms relevant to cryptography described in English, mathematical functions, and source code).

153 . Virtually any representation or depiction of someone’s doing something or any explanation of how to do something can be “taken as” instructions by a person so inclined. The so-called “copycat” cases, like *Yakubowicz v. Paramount Pictures Corp.*, 536 N.E.2d 1067 (Mass. 1989) (First Amendment bars liability against producer of

motion picture where viewers killed a youth while allegedly imitating the violence depicted therein), and *Video Software Dealers Ass'n v. Webster*, 968 F.2d 684 (8th Cir. 1992) (invalidating on constitutional grounds state statute prohibiting the sale or rental to minors of videos “depicting violence”), exemplify the first case. *Herceg v. Hustler Magazine, Inc.*, 814 F.2d 1017 (5th Cir. 1987) (denying civil liability claim for death caused by following procedures described in magazine), *cert. denied*, 485 U.S. 959 (1988) and *Rice v. Paladin Enters., Inc.*, 128 F.3d 233 (4th Cir. 1997) (permitting wrongful death suit against publisher of manual for assassins on aiding-and-abetting theory), *cert. denied*, 523 U.S. 1074 (1998) illustrate the second.

154 . See Terri R. Day, *Publications that Incite, Solicit, or Instruct: Publisher Responsibility or Caveat Emptor*, 36 Santa Clara L. Rev. 73, 92-100 (1995) (discussing consensus view of courts that publishers are not liable in tort for content of “how-to” publications because of First Amendment considerations).

155 . For instance, the courts have long sought to distinguish “abstract” advocacy of illegal conduct from more concrete “teaching” or training. See, e.g., *Dennis v. United States*, 341 U.S. 494, 581 (1951) (Douglas, J., dissenting) (arguing that the mere abstract teaching of the moral propriety of violence is protected, but not “the teaching of methods of terror”); *Brandenburg v. Ohio*, 395 U.S. 444, 448 (1969) (distinguishing abstract teaching from “preparing a group for violent action and steeling it to such action” (quoting *Noto v. United States*, 367 U.S. 290, 297-98 (1961))).

156 . See *infra* Part IV.A.

157 . Under the encryption export regulations, printed encryption source code is not controlled. See 15 C.F.R. § 734.3 (b) (1996).

158 . See *infra* Part IV.B.1-2.

159 . Perhaps the best evidence for this proposition is the export regulations themselves, which generally exempt from licensing the export of software that results from fundamental research or is educational. See 15 C.F.R. §§ 734.3 (b)(3), 734.8, 734.9 (1996) (supplement defining “fundamental research” and “educational”).

160 . First Amendment doctrines that permit facial invalidation of statutes that unconstitutionally restrict speech acts are the most obvious example. See, e.g., *Brockett v. Spokane Arcades, Inc.*, 472 U.S. 491, 503 (1985) (discussing the overbreadth doctrine); *NAACP v. Button*, 371 U.S. 415, 432-33 (1963) (holding that enforcement of statute may be invalid if it prohibits First Amendment conduct “whether or not . . . the petitioner has engaged in privileged conduct”). In general, the Court manages this penumbra by using formal doctrines like vagueness or procedural devices like shifting or increasing burdens of persuasion. See, e.g., *Speiser v. Randall*, 357 U.S. 513, 526 (1958) (“Where the transcendent value of speech is involved, due process certainly requires in the circumstances of this case that the State bear the burden of persuasion to show that the appellants engaged in criminal speech.” (citation omitted)).

161 . Programmers normally publish source code when they intend for their software to be read. If there’s only one level of programming language for the software, then of course we cannot rely on this rough-and-ready distinction. Also, some programmers read and write object code the way that others read and write source code, and they may well publish object code as a speech act. See Clapes, *supra* note 13, at 941 (“In the early days of programming, programs were written by humans directly in object code form. Object code could obviously be read in those days.”).

In my example, the provision against viewing the object code rules out communicative intent on the speaker's part.

162 . See, e.g., Wagner, *supra* note 149, at 388 (using example of software for “cracking” into computers); Nguyen, *supra* note 5, at 677.

163 . Such conduct is illegal under federal law. See Nguyen, *supra* note 5, at 677 (citing 18 U.S.C. § 1030(a)(5)(A) (1994)).

164 . Other acts involving viruses are speech acts. One can publish a virus without infecting computers. Indeed, publishing virus source code may be a way to help others fight it.

165 . See Nguyen, *supra* note 5, at 677 (“Suppose someone put a simple command on her internet page, consisting of the words ‘Delete All,’ which, when triggered by a vulnerable party innocently browsing the page, would wipe the victim’s entire hard disk drive.” (citation omitted)).

166 . See, e.g., *Lovell v. Griffin*, 303 U.S. 444 (1938).

167 . My personal experience is that many bookstore employees (if not the store itself) do care about the books they sell and the recommendations they make about book purchases.

168 . See *City of Lakewood v. Plain Dealer Publ’g Co.*, 486 U.S. 750, 768 (1988) (holding that discretionary newsrack licensing scheme infringes “right to circulate newspapers”).

169 . See *Riley v. National Fed’n of the Blind of N.C., Inc.*, 487 U.S. 781, 801 (“It is well settled that a speaker’s rights are not lost merely because compensation is received; a speaker is no less a speaker because he or she is paid to speak.”); *New York Times Co. v. Sullivan*, 376 U.S. 254, 266 (1964) (“That the Times was paid for publishing the advertisement is as immaterial in this connection as is the fact that newspapers and books are sold.”).

170 . See *Ex parte Jackson*, 96 U.S. 727, 733 (1878); *Lovell v. Griffin*, 303 U.S. 444, 452 (1938).

171 . See *Bernstein IV*, 176 F.3d 1132, 1148-49 (9th Cir. 1999) (arguing that while “academics and computer programmers” may use source code communicatively, most people neither understand nor are interested in what is said in source code).

172 . One need only browse the newsstand or scientific parts of today’s mega-bookstores to see many highly technical publications being offered to the public at large.

173 . See *Karn v. United States Dep’t of State*, 925 F. Supp. 1, 3 (D.D.C. 1996), *remanded*, 107 F.3d 923 (D.C. Cir. 1997).

174 . The government’s position that printed source code is simply “not subject to the EAR” should have doomed licensing of source code published electronically under cases like *Florida Star v. B.J.F.*, 491 U.S. 524, 541 (1989), under which the government lacks a compelling interest in prohibiting the publication of information that is already

in the public domain.

175 . In *Karn*, the D.C. Circuit used a hypothetical involving a program that operates a tank. That hypothetical involves the use of software that is clearly not a speech act. *See* Transcript of Proceedings at 28:8-14, *Karn v. United States Dep't of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121).

176 . *See Minneapolis Star & Tribune Co. v. Minnesota Comm'r of Revenues*, 460 U.S. 575 (1983) (striking down tax on newsprint and ink that imposed disproportionate burden on publication).

177 . *See generally City of Lakewood v. Plain Dealer Publ'g Co.*, 486 U.S. 750 (1988).

178 . *See Arcara v. Cloud Books, Inc.*, 478 US 697, 706-07 (1986) (finding First Amendment scrutiny warranted if “statute based on a non-expressive activity has the inevitable effect of singling out those engaged in expressive activity”); *id.* at 708 (O'Connor, J., concurring) (using generally applicable law to close bookstore may be pretextual).

179 . *See United States v. United States District Court*, 407 U.S. 297, 314 (1972) (“fear of unauthorized official eavesdropping” may deter “discussion of Government action in private conversations”).

180 . That software applications, like Web browsers or word-processing programs, are “tools of speech” should not lead to many practical difficulties. In many cases, that a speech act is at issue will trigger only intermediate scrutiny, or even no First Amendment scrutiny if the statute is a law of general applicability. *See, e.g., Cohen v. Cowles Media*, 501 U.S. 663, 669 (1991) (stating that “generally applicable laws do not offend the First Amendment simply because their enforcement against the press has incidental effects on its ability to gather and report the news” and allowing breach of contract claim against newspaper for identifying confidential source); *Arcara*, 478 U.S. at 703-04 (stating that generally applicable laws are subject to First Amendment scrutiny if they disproportionately burden speech or if the conduct that drew the sanction itself had a significant expressive component).

181 . Solum argues for a strong distinction between “pure” communicative action and “strategic action.” He seems to say, following Habermas, that if even one participant in a linguistically mediated interaction has perlocutionary intent, the overall interaction is strategic rather than communicative. *See Solum, supra* note 18, at 91. But Solum recognizes that speech often seems to have a “mixed nature.” He suggests that much speech that appears strategic because it appeals to emotion or rhetoric to persuade is not necessarily strategic.

182 . This is an interesting issue for encryption software and other software that might be considered “tools of speech.”

183 . *See Nimmer, supra* note 26, at 37 n.36 (“There is no reason why the fact that the actor may intend his conduct to cause both a meaning and nonmeaning effect should in itself negate the protection to be accorded the meaning effect.”).

184 . *See Solum, supra* note 18, at 92 (“[I]t may be possible to identify individual speech acts and certain classes of speech acts as predominantly strategic or predominantly communicative.”).

185 . 896 F.2d 1183 (9th Cir. 1990).

186 . *See id.* at 1184 (“SOAP could be used to record and review information about game schedules, point spreads, scores, customer balances, and bets. A SOAP user could calculate changing odds and factor in a bookmaker’s fee to bets . . . . The defendants knew that most customers used SOAP for illegal bookmaking.”).

187 . *Id.* at 1185.

188 . *See id.* at 1186; *see also* *United States v. Freeman*, 761 F.2d 549, 552 (9th Cir. 1985) (“Where speech becomes an integral part of the crime, a First Amendment defense is foreclosed even if the prosecution rests on words alone.”).

189 . *See Freeman*, 761 F.2d at 552 (explaining that First Amendment defense must go to jury on counts under which defendant advocated violations of tax laws at seminars, but not on counts where he prepared, reviewed and approved false tax returns, because “the First Amendment is quite irrelevant if the intent of the actor and the objective meaning of the words used are so close in time and purpose to a substantive evil as to become part of the ultimate crime itself”).

190 . *See Stanley v. Georgia*, 394 U.S. 557, 565 (1968) (“A state has no business telling a man sitting alone in his own home, what books he may read or what films he may watch.”). This article focuses almost entirely on communicative speech acts; acts of “pure” expression and reception (*e.g.*, reading) are beyond the scope of this article.

191 . *See Spece & Weinzierl*, *supra* note 14, at 214-15 (“Although considered alone experimentation might not be communicative and entitled to First Amendment coverage, when considered with other parts of the pursuit of science which are clearly communicative, both they and it are entitled to constitutional [First Amendment] coverage.”); *see also* Francione, *supra* note 14, at 471-73 (criticizing the argument that all experimentation is protected merely as a precondition of scientific publication, but noting that First Amendment may well apply if government regulates out of concern for the information to be published).

192 . *See supra* Part III.C.1.

193 . For instance, Carnegie-Mellon University maintains a Computer Emergency Response Team that coordinates the sharing of information about various kinds of malicious attacks. *See* Carnegie Mellon Software Engineering Institute, *CERT Coordination Center*, <<http://www.cert.org>> (visited Apr. 9, 2000). Obviously, commercial vendors of anti-virus software also study viruses.

194 . *See, e.g.*, *ALT.COMP.VIRUS Posting Guidelines*, <<http://www.faqs.org/faqs/computer-virus/posting-guidelines>> (visited Apr. 9, 2000) (showing that Usenet users post virus source code); *Virus Bulletin*, <<http://www.virusbtn.com>> (visited Apr. 9, 2000) (showing online journal devoted to computer viruses).

195 . Some First Amendment doctrines seem to require a general, probabilistic assessment of this issue. Bernstein, for instance, facially challenged the encryption export regulations. A licensing scheme may be facially challenged if, among other things, it has a “close enough nexus to expression, or to conduct commonly associated with expression” to pose a threat of censorship. *See City of Lakewood v. Plain Dealer Publ’g Co.*, 486 U.S. 750, 759 (1988). Thus,

while Judge Nelson, dissenting in *Bernstein IV*, appeared to accept that Professor Bernstein's as-applied challenge was valid, he argued that Professor Bernstein was not entitled to bring a facial challenge because "encryption source code is not conduct commonly associated with expression . . . . The overwhelming majority of people do not want to talk about the source code and are not interested in any recondite message that may be contained in encryption source code." *Bernstein IV*, 176 F.3d 1132, 1149 (9th Cir. 1999) (Nelson, J., dissenting). The doctrinal answer to Judge Nelson's concern about the propriety of facial attack is that he misreads *Lakewood* and misread the encryption regulations as a law of general application. Even if one believes that the risk of censorship is low, the discretionary nature of the regulatory scheme is damning. *See* *Saia v. New York*, 334 U.S. 558, 562 (1948) ("In this case a permit is denied because some persons were said to have found the sound annoying. In the next one a permit may be denied because some people find the ideas annoying. Annoyance at ideas can be cloaked in annoyance at sound."). The theoretical answer is that he wrongly assumes that *Freedman-Lakewood* facial challenges are like overbreadth facial challenges, which are concerned primarily with the quantity of impermissible applications. But the *Freedman-Lakewood* doctrine is a type of "valid rule" facial challenge that isn't resolved by a quantitative assessment. *See generally* Marc E. Isserles, *Overcoming Overbreadth: Facial Challenges and the Valid Rule Requirement*, 48 Am. U. L. Rev. 359 (1998).

196 . *See, e.g.*, Joel C. Mandelman, *Lest We Walk into the Well: Guarding the Keys, Encrypting the Constitution*, 8 Alb. L.J. Sci. & Tech. 227, 255 (1998) ("What 'idea' or 'controversial thoughts' are expressed by an algorithm? The answer is none."); *Karn v. United States Dep't of State*, 925 F. Supp. 1, 9 n.19 (D.D.C. 1996), *remanded* 107 F.3d 923 (D.C. Cir. 1997) ("Source codes are merely a means of commanding a computer to perform a function.").

197 . *See, e.g.*, *Bernstein IV*, 176 F.3d at 1149 (Nelson, J., dissenting) ("Only a few people can actually understand what a line of source code would direct a computer to do."); *Junger v. Daley*, 8 F. Supp. 2d 708, 717 (N.D. Ohio 1998) ("[E]ncryption source code . . . is all but unintelligible to most people."), *rev'd and remanded*, No. 98-4045, 2000 U.S. App. LEXIS 6161 (6th Cir. Apr. 4, 2000).

198 . *See* *Spence v. Washington*, 418 U.S. 405, 411 (1974).

199 . *See id.* at 409 (because "appellant did not choose to articulate his views through printed or spoken words," the Court must "determine whether his activity was sufficiently imbued with elements of communication" to be covered by First Amendment).

200 . 8 F. Supp. 2d 708 (N.D. Ohio 1998), *rev'd and remanded*, *Junger v. Daley*, No. 98-4045, 2000 U.S. App. LEXIS 6161, at \*10 (6th Cir. Apr. 4, 2000). In reversing the district court in *Junger*, the Sixth Circuit agreed that "computer source code, though unintelligible to many, is the preferred method of communication among computer programmers" and "is an expressive means for the exchange of information and ideas about computer programming." *Junger v. Daley*, No. 98-4045, 2000 U.S. App. LEXIS, at \*10.

201 . *See Bernstein IV*, 176 F.3d at 1148 (Nelson, J., dissenting) ("encryption source code is more like conduct than speech"); *Bernstein I*, 922 F. Supp. 1426, 1434 (N.D. Cal. 1996) (government argued that Snuffle was "not speech but conduct"); *Clark v. Community for Creative Non-Violence*, 468 U.S. 288, 293 n.5 (1984) (finding that one who desires to engage in assertedly expressive conduct has the burden "to demonstrate that the First Amendment even applies").

202 . *See Junger*, 8 F. Supp. 2d at 716 ("'Speech' is not protected simply because we write it in a language. . . . what

determines whether the First Amendment protects something is whether it expresses ideas.”) (citation omitted). *See generally* Wagner, *supra* note 149, at 402-03 (terming Judge Patel’s approach “formalistic” and criticizing the use of linguistic form as an analytical device).

203 . *See* Junger, 8 F. Supp. 2d at 717 (“‘Fighting words’ are written or spoken in a language. . . . [but] they are excluded from First Amendment protection.”) (citing *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942) (holding that fighting words are not protected by First Amendment)). The definition of fighting words is somewhat fuzzy, but it is generally understood as face-to-face insults that would provoke the average addressee to respond violently. *See* *Gooding v. Wilson*, 405 U.S. 518, 523 (1971).

204 . *R.A.V. v. City of St. Paul*, 505 U.S. 377, 383 (1992). At issue in *R.A.V.* was a juvenile’s prosecution under an ordinance prohibiting bias-motivated crimes for burning a cross in a black family’s yard. The defendant sought to dismiss the charge on First Amendment grounds, and the state Supreme Court ultimately construed the ordinance as limited to conduct that amounted to fighting words. *See id.* at 379-80. The U.S. Supreme Court held that even as construed, the ordinance constituted impermissible viewpoint-based discrimination under the First Amendment. *See id.* at 391-92.

205 . *Id.* at 383-84. “Thus, the government may proscribe libel; but it may not make the further content discrimination of proscribing only libel critical of the government.” *Id.* at 384.

206 . *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942); *accord R.A.V. v. City of St. Paul*, 505 U.S. 377, 385 (1992) (“We have not said that [fighting words] constitute ‘no part of the expression of ideas,’ but only that they constitute ‘no essential part of any exposition of ideas’ . . .”).

207 . In *Bernstein IV*, Judge Fletcher also held that encryption source code (and presumably all source code) is covered by the First Amendment. *See Bernstein IV*, 176 F.3d 1132, 1141 (9th Cir. 1999). She found that source code is “meant to be read and understood by humans” and “can be used to express an idea or a method.” *Id.* at 1140. Furthermore, “in the field of cryptography . . . cryptographic ideas and algorithms are conveniently expressed in source code.” *Id.* at 1141. “By utilizing source code, a cryptographer can express algorithmic ideas with precision and methodological rigor that is otherwise difficult to achieve,” which “facilitat[es] peer review . . . . Thus, cryptographers use source code to express their scientific ideas in much the same way that mathematicians use equations or economists use graphs.” *Id.* Thus, Judge Fletcher rejected the government’s functionality argument, which at this point in the case was invoked to show that the EAR is not directed toward software’s communicative aspect. *See id.* at 1141-42.

208 . *See Bernstein IV*, 176 F.3d at 1148-49 (Nelson, J., dissenting) (“Software engineers generally do not create software in object code . . . because it would be enormously difficult . . . . [they] use high-level computer programming languages . . . to create source code as a shorthand method . . . . In this respect, lines of source code are the building blocks or the tools used to create an encryption machine.”). *See also* Mandelman, *supra* note 196, at 247-68.

209 . During oral argument in *Karn v. United States Dep’t of State*, for instance, one judge referred to how programmers “draw inferences” from “the program information.” Transcript of Proceedings at 22:15-19, *Karn v. United States Dep’t of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121). This comment indicates that he was dubious that programmers really read software. In a later comment, the judge sought to distinguish, as did the district

court in *Karn*, between the program and its comments. See *Karn v. United States Dep't of State*, 925 F. Supp. 1, 9 n.19 (D.D.C. 1996) *remanded*, 107 F.3d 923 (D.C. Cir. 1997). Some comments are clearly text, but “that doesn’t seem to work on what are really the guts of [the program].” See Transcript of Proceedings at 22:16-17, *Karn v. United States Dep't of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121).

210 . For discussions of reverse engineering, see Clapes, *supra* note 13, at 931-47 (1994).

211 . See *infra* Part IV.C.3.b.

212 . I do not rule out the possibility of First Amendment coverage of reverse-engineering or other scientific analysis of physical objects by reference to the conventions of the scientific community. Even a stand-alone encryption box can be used in a communicative way. I could, in a lecture, take the box apart to show a class of students how the box works. This is a complex speech act for which both object and words are integral. What I say about what I’m doing—annotating, one might call it—depends on the box itself, and vice versa. As I argued earlier, presenting something in an expository way is a speech act no matter what is presented. This bothers people, it seems, because this allows anything to be presented. But I’m only saying that the act is a speech act and therefore covered, not that it’s necessarily protected.

213 . See Hamilton & Sabety, *supra* note 129, at 265 (“Computer languages are composed of a set of grammar rules and a set of symbols.”).

214 . *Junger v. Daley*, 8 F. Supp. 2d 708, 717 (N.D. Ohio 1998).

215 . See *infra* Part IV.B.1.

216 . See *Spence v. Washington*, 418 U.S. 405, 410-11 (1974).

217 . *Spence* also examines “the nature of [the] activity, combined with the factual context and environment in which it was undertaken” to determine whether the activity has enough communicative elements to receive protection under the First Amendment. *Id.* at 409-10. This approach is better; it doesn’t assign the audience any fixed role in assessing whether an act is a speech act. And I think it is self-evident that publishing software in source code form on the Internet for academic purposes would be speech under this part of *Spence*.

218 . See, e.g., *Bernstein IV*, 176 F.3d 1132, 1146 (9th Cir. 1999) (holding that “the availability and use of secure encryption may offer an opportunity to reclaim some portion of the privacy we have lost”).

219 . The entire notion of incomprehensibility, of course, turns on meaninglessness. The district courts in both *Karn* and *Junger* assumed that software is thought of as a tool by non-programmers. See *Karn v. United States Dep't of State*, 925 F. Supp. 1, 9-10 (D.D.C. 1996), *remanded* 107 F.3d 923 (D.C. Cir. 1997); *Junger v. Daley*, 8 F. Supp. 2d 708, 712 (N.D. Ohio 1998), *rev'd and remanded*, *Junger v. Daley*, No. 98-4045, 2000 U.S. App. LEXIS 6161, at \*10 (6th Cir. Apr. 4, 2000).

220 . In this country, there’s a widespread social convention that raising one’s hand is a request for attention.

- 221 . See *United States v. Progressive Inc.*, 467 F. Supp. 990, 998-1000 (W.D. Wis.), *reh'g denied*, 486 F. Supp. 5 (W.D. Wis.), *appeal dismissed*, 610 F.2d 819 (7th Cir. 1979) (government sought injunction against publication of information allegedly useful to making nuclear weapons).
- 222 . See, e.g., Adam Kegley, Note, *Regulation of the Internet: The Application of Established Constitutional Law to Dangerous Electronic Communication*, 85 Ky. L.J. 997, 1011-19 (1996/1997) (describing Congressional debate and testimony about bomb-making information on the Internet).
- 223 . The Court's main vehicle for creating categories of "proscribable" speech has been the reasoning summarized in *Chaplinsky v. New Hampshire*, 315 U.S. 568, 572 (1942) (excluding "utterances [that] are no essential part of any exposition of ideas, and are of such slight social value as a step to truth that any benefit that may be derived from them is clearly outweighed by the social interest in order and morality"). Although such categories are clearly content-based, within them "the evil to be restricted so overwhelmingly outweighs the expressive interests, if any, at stake, that no process of case-by-case adjudication is required." *New York v. Ferber*, 458 U.S. 747, 763-64 (1982).
- 224 . See *Miller v. California*, 413 U.S. 15 (1973) (obscenity); *Ferber*, 458 U.S. at 757-58 (child pornography); *FCC v. Pacifica Foundation*, 438 U.S. 726 (1978) (indecency). Obviously, these categories of speech are based largely on *Chaplinsky's* notion of the social interest in morality, although in *Ferber* the Court also emphasized the psychological harm experienced by children in the production and dissemination of child pornography. See *Ferber*, 458 U.S. at 757-58.
- 225 . See *Brandenburg v. Ohio*, 395 U.S. 444, 449 (1969).
- 226 . See *Virginia Bd. of Pharmacy v. Virginia Citizens Consumer Council, Inc.*, 425 U.S. 748, 763 (1976) (in addressing a ban on prescription drug prices, the Court found that "a particular consumer's interest in the free flow of commercial information" may be keener than interest in "the day's most urgent political debate"). Note here that the reasons articulated for subjecting commercial speech to intermediate scrutiny are mostly unrelated to its utility.
- 227 . See *American Booksellers Ass'n, Inc. v. Hudnut*, 771 F.2d 323, 333 (7th Cir. 1985), *aff'd mem.*, 475 U.S. 1001 (1986) ("Much speech is dangerous. Chemists whose work might help someone build a bomb, political theorists whose papers might start political movements that lead to riots, speakers whose ideas attract violent protesters, all these and more leave loss in their wake.") (emphasizing necessity of direct causation and speaker's intent).
- 228 . See *Schaumburg v. Citizens For Better Env't.*, 444 U.S. 620, 632 (1980).
- 229 . See *Bernstein IV*, 176 F.3d 1132, 1141-42 (9th Cir. 1999) ("[T]he government maintains that source code is different from other forms of expression (such as blueprints, recipes, and 'how-to' manuals) because it can be used to control directly the operation of a computer without conveying information to the user.").
- 230 . *Junger v. Daley*, 8 F. Supp. 2d 708, 717 (N.D. Ohio 1998).
- 231 . See *Bernstein IV*, 176 F.3d at 1147 (Nelson, J., dissenting) ("[T]he basic function of encryption source code is to act as a method of controlling computers.").

232 . *See id.* at 1148 (“[P]rograms are, in fact, machines . . . that have been constructed in the medium of text (source code and object code)”).

233 . *See* National Commission on New Technological Uses of Copyrighted Works, Final Report 23 (1978).

234 . A third point might be that software is like a device in that it’s complete—its function can be performed without more, in contrast to a procedure like a recipe, which requires cooking equipment, ingredients, and so on. But software itself does nothing. A person must use it, and on a computer. By focusing on software as a thing we efface the relevant actor. Software is both recipe and thing only in that the government cares about what people do with it. Bomb-making information isn’t a bomb, but the government cares about its being used to make bombs.

235 . *See* *Junger v. Daley*, 8 F. Supp. 2d 708, 717 (N.D. Ohio 1998), *rev’d and remanded*, No. 98-4045, 2000 U.S. App. LEXIS 6161 (6th Cir. Apr. 4, 2000).

236 . 107 F.3d 923 (D.C. Cir. 1997).

237 . *See* Transcript of Proceedings at 22:21-23, *Karn v. United States Dep’t of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121).

238 . *See id.* at 22:21-23, 27:24 (“But a floppy disk is itself a machine.”).

239 . *See* 17 U.S.C. § 101 (1994) (“[L]iterary works” are copyrightable “regardless of the nature of the material objects . . . in which they are embodied.”).

240 . *See* Transcript of Proceedings at 24:17-23, *Karn v. United States Dep’t of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121) (“[T]he code itself seems to be something that is not like a design manual. It’s like a machine or process that builds the AWACs. Add . . . water and there you have it.”).

241 . *See id.* at 25:17-22 (“But it seems to be something that the computer does, right? A person doesn’t do the compiling . . . . You slip the disk in and the source code is compiled into object code.”).

242 . This point has been recognized by some commentators. *See* *Nguyen*, *supra* note 5, at 676-78 (“[S]oftware inseparably incorporates elements of both expression and function.” First Amendment protection “attaches not to particular *things* or types of *objects* . . . but to *activities* where the free exchange of ideas and information is at stake.”).

243 . *See* *Junger v. Daley*, 8 F. Supp. 2d 708, 716 (N.D. Ohio 1998) (finding that some software “is inherently functional. With such software, users look to the performance of tasks with scant concern for the methods employed or the software language used to control such methods. Among computer software programs, encryption software is especially functional rather than expressive.”), *rev’d and remanded*, No. 98-4045, 2000 U.S. App. LEXIS 6161 (6th Cir. Apr. 4, 2000).

244 . *See id.* (“In the overwhelming majority of circumstances, encryption source code is exported to transfer

functions, not to communicate ideas . . . . For the broad majority of persons receiving such source code, the value comes from the function the source code does.”).

245 . Lathes are used to shape objects like table legs by following a template or silhouette, the way that copies of keys are made at the hardware store from an original key. *See* Transcript of Proceedings at 30:21-25, 31:1-7, *Karn v. United States Dep’t of State*, 107 F.3d 923 (D.C. Cir. 1997) (No. 96-5121).

246 . *See id.* at 30: 9-16.

247 . One might shift “functionality” from software itself to its form of expression, i.e. programming languages, which are also tools. But we’re simply pushing the fallacy down a level.

248 . 514 U.S. 159 (1995).

249 . *See id.* at 164 (“The functionality doctrine prevents trademark law . . . from inhibiting legitimate competition by allowing a producer to control a useful product feature” for longer than if the feature were protected by patent.”).

250 . *See id.* at 162.

251 . *See id.* at 166; Peter Koebler, Note, *Qualitex Co. v. Jacobson Products Co.*, 115 S. Ct. 1300 (1995): *It is Possible to Trademark Color Alone*, 12 Computer & High Tech. L.J. 509, 516 (1996).

252 . *See Qualitex*, 514 U.S. at 166.

253 . *See* Koebler, *supra* note 251, at 509. A few circuits had departed from this rule. *See id.* at 510.

254 . Trademark law recognizes two main kinds of functionality. Utilitarian functionality refers to a feature that affects the use, purpose, cost or quality of the product. *See* *Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 456 U.S. 844, 850 n.10 (1982). Aesthetic functionality refers to features that make products more aesthetically attractive to consumers. *See* Koebler, *supra* note 251, at 515-16. The traditional rule also relied on theories of “color depletion” and “shade confusion.” *See Qualitex*, 514 U.S. at 167-69 (rejecting both theories).

255 . *See Qualitex*, 514 U.S. at 164.

256 . Conversely, not identifying oneself as a speaker—speaking anonymously—is also a speech act. *See* *McIntyre v. Ohio Elections Comm’n*, 514 U.S. 334, 342 (1995) (“[A]n author’s decision to remain anonymous, like other decisions concerning omissions or additions to the content of a publication, is an aspect of the freedom of speech protected by the First Amendment.”).

257 . *See, e.g., Bernstein IV*, 176 F.3d 1132, 1148 (9th Cir. 1999) (Nelson, J., dissenting) (noting that “[w]hile it is conceptually difficult to categorize encryption source code under our First Amendment framework, I am still inevitably led to conclude that encryption source code is more like conduct than speech” because “it is inherently a functional device.”); *Junger v. Daley*, 8 F. Supp. 2d 708, 716 (N.D. Ohio 1998), *rev’d and remanded*, No. 98-4045,

2000 U.S. App. LEXIS 6161 (6th Cir. Apr. 4, 2000).

258 . See *Junger*, 8 F. Supp. 2d at 716.

259 . See generally Jane Ginsburg, *Four Reasons and a Paradox: The Manifest Superiority of Copyright over Sui Generis Protection of Computer Software*, 94 Colum. L. Rev. 2559 (1994).

260 . See Jessica Litman, *Copyright in Stage Direction of a Broadway Musical*, 7 Colum.-VLA J.L. & Arts 309, 312-18 (1982).

261 . See Peter Suber, *What is Software?*, 2 J. Speculative Phil. 89, 90 (1988) (asking “[i]s Bach’s written score to the *Art of the Fugue*, perhaps with a human interpreter thrown in, the software of an organ?”); Balkin & Levinson, *Hermeneutic*, *supra* note 59, at 1531 (noting that “[a] Beethoven symphony is more than a set of marks on a page; its score is merely a set of directions for performance”).

262 . See Brief for the Appellants at 27-28, *Bernstein v. United States Dep’t of Justice*, 176 F.3d 1132 (9th Cir. 1999) (No. 97-16686) (“[R]ecipients of encryption source code do not have to be able to read and understand it in order to use it. . . . [but] a recipe cannot be used to make a casserole or a cake unless it is read by a person who understands the information it contains.”).

263 . See *id.* at 28.

264 . I’m ignoring “autonomous” software, like viruses, which can simply be “released” onto computers or the Internet and wreak havoc. Arguably, infecting a computer with a virus is no more a speech act than infecting a person with a virus.

265 . See *Bernstein IV*, 176 F.3d 1132, 1142 (9th Cir. 1999).

266 . See, e.g., *NAACP v. Claiborne Hardware*, 458 U.S. 886, 915-20 (1982) (finding civil liability for speech acts requires both causation and specific intent); *New York Times v. United States*, 403 U.S. 713, 730 (1971) (Stewart, J., concurring) (obtaining an injunction against publication requires showing of direct, immediate, irreparable harm to national security); *Brandenburg v. Ohio*, 395 U.S. 444 (1969) (per curiam) (defining punishable incitement to violence in terms of both likelihood and imminence of harm and speaker intent).

267 . This question does not squarely arise in *Bernstein* and its companion cases because the export licensing scheme, as a prepublication licensing scheme, is an unconstitutional prior restraint under *Freedman v. Maryland*, 380 U.S. 51, 58-60 (1965), and *City of Lakewood v. Plain Dealer Publishing Co.*, 486 U.S. 750 (1988).

268 . The line between communicative and noncommunicative effects is unclear. See discussion of “secondary effects” in which Williams generally defines a communicative impact as “a harm that would not occur unless a message were being sent and received,” but also recognizes a subcategory of harms “that do[] not depend on the content or viewpoint of the message, only on the fact that it is intended and understood as a message.” Susan Williams, *Content Discrimination and the First Amendment*, 139 U. Pa. L. Rev. 615 n.180 (1991) (using example of heckling and distinguishing unintended interferences with speaking like loud coughing). A law that prohibits

heckling aims at a speech act and at its communicative impact, but is not content-based.

269 . See *Turner Broadcasting System, Inc. v. FCC*, 512 U.S. 622, 642 (1994).

270 . Nevertheless, commentators have long noted that it can be difficult to draw a line between government's concern about a message and about the message's consequences. "[W]hen one does not 'like' an idea, it is as often as not because one does not like what would happen if people agreed with it." Geoffrey R. Stone, *Restrictions of Speech Because of its Content: The Peculiar Case of Subject-Matter Restrictions*, 54 U. Chi. L. Rev 81, 104 n.116 (1978).

271 . See, e.g., *NAACP v. Claiborne Hardware Co.*, 458 U.S. 886, 916-17 (1982) (action for damages arising from boycott protesting racism) ("[T]he presence of activity protected by the First Amendment imposes restraints on the grounds that may give rise to damages liability and on the persons who may be held accountable for those damages.").

272 . See, e.g., *Brandenburg v. Ohio*, 395 U.S. 444 (1969) (defining unprotected "incitement" in terms of intent).

273 . See, e.g., *Karn v. United States Dep't of State*, 925 F. Supp. 1, 11 (noting that "proliferation of cryptographic products will make it easier for foreign intelligence targets to deny the United States Government access to information vital to national security"), *remanded* 107 F.3d 923 (D.C. Cir. 1997).

274 . See *Edwards v. South Carolina*, 372 U.S. 229, 237 (1963) (finding speech protected against regulation on the basis of hostile audience reaction, the so-called heckler's veto).

275 . For a description of the old bad tendency test, see David M. Rabban, *The Emergence of Modern First Amendment Doctrine*, 50 U. Chi. L. Rev. 1205, 1229-31 (1983).

276 . See Brief for the Appellants at 33 n.13, *Bernstein v. United States Dep't of Justice*, 176 F.3d 1132 (9th Cir. 1999) (No. 97-166861) ("Even if the person exporting the software does not intend or expect that the software will be used for purposes contrary to this country's national security and foreign policy interests, he has no direct control over the use to which the software will be put once it has been exported, particularly if the software is made available for unrestricted downloading via the Internet.").

277 . See, e.g., *Claiborne*, 458 U.S. at 918.

278 . See generally Schauer, *supra* note 130 (discussing speech-caused harms and the differences between causation in ordinary tort law and First Amendment law).

279 . See *The Florida Star v. B.J.F.*, 491 U.S. 524, 540 (1989) ("Where important First Amendment interests are at stake, the mass scope of disclosure is not an acceptable surrogate for injury.").

280 . See Schauer, *supra* note 130, at 165 n.90.

281 . See, e.g., *Herceg v. Hustler Magazine, Inc.*, 814 F.2d 1017 (5th Cir. 1987) (holding that the First Amendment

bars liability against magazine where reader accidentally committed suicide while attempting technique of autoerotic asphyxiation described therein), *cert. denied*, 485 U.S. 959 (1988); *Yakubowicz v. Paramount Pictures Corp.*, 536 N.E.2d 1067 (Mass. 1989) (finding that the First Amendment bars liability against producer of motion picture where viewers killed a youth while allegedly imitating the violence depicted therein).

282 . *See, e.g.*, *Smith v. Linn*, 563 A.2d 123 (Pa. Super. Ct. 1989) (finding that the First Amendment barred liability against publisher of diet book after reader died as result of following diet), *aff'd mem.*, 587 A.2d 309 (Pa. 1991); *Alm v. Van Nostrand Reinhold Co.*, 480 N.E.2d 1263 (Ill. App. Ct. 1985) (holding that the First Amendment barred liability against publisher of “how-to” book where reader had been injured while following instructions therein). The one notable exception is the line of cases involving airplane navigational charts. *See Brocklesby v. United States*, 767 F.2d 1288, 1294-95 (9th Cir. 1985).

283 . *See, e.g.*, *American Booksellers Ass’n v. Hudnut*, 771 F.2d 323, 328-29 (7th Cir. 1985) (statute permitting civil liability against producers of depictions of sexually explicit subordination of women is unconstitutional, even accepting the premises that “[m]en who see women depicted as subordinate are more likely to treat them so” and that people are likely to “act in accordance with the images and patterns” they find in such expression), *aff'd mem.*, 475 U.S. 1001 (1986); *Video Software Dealers Ass’n v. Webster*, 968 F.2d 684 (8th Cir. 1992) (invalidating on constitutional grounds state statute prohibiting the sale or rental to minors of videos “depicting violence”).

284 . *See Nimmer, supra* note 26, at 39.

285 . *See id.* at 43 (quoting *Tinker v. Des Moines Indep. School Dist.*, 393 U.S. 503, 509 (1969)).

286 . *See id.* at 44.

287 . 395 U.S. 444 (1969) (per curiam).

288 . 458 U.S. 886 (1982).

289 . The Mississippi Supreme Court found liability on a common-law tort theory. Based on evidence that fear of reprisals caused some black citizens to withhold their patronage from respondents’ businesses, the court held that the entire boycott was unlawful and affirmed petitioners’ liability for all damages “resulting from the boycott” on the ground that petitioners had agreed to use force, violence, and “threats” to effectuate the boycott. *See id.* at 894-895. The record showed that there were some incidents of violence. *See id.* at 902-06.

290 . *See id.* at 916-17.

291 . *Id.* at 918 (citations omitted).

292 . Whether the government would be willing to submit evidence describing the nature and extent of its signals intelligence activities overseas is, of course, an open question.

293 . *See Abrams v. United States*, 250 U.S. 616, 621 (1919) (noting that “[m]en must be held to have intended, and to be accountable for, the effects which their acts were likely to produce”).

294 . See *NAACP v. Claiborne*, 458 U.S. 886, 916-17 (1981) (noting that the First Amendment “imposes restraints . . . on the persons who may be held accountable”). Another expression of the concern for moral agency is the anti-paternalism principle often seen in commercial speech cases. Under this principle, commercial speakers may not be regulated for truthful, nonmisleading speech simply because listeners may act unwisely. See *Virginia Bd. of Pharmacy v. Virginia Citizens Consumer Council, Inc.*, 425 U.S. 748, 770 (1976) (rejecting “highly paternalistic” argument that consumers will misuse accurate price information).

295 . See, e.g., *United States v. X-Citement Video, Inc.*, 513 U.S. 64, 73 n.3 (1994) (examining whether the defendant could be convicted for trafficking in child pornography absent knowledge that the performer was a minor and noting that “[c]riminal intent serves to separate those who understand the wrongful nature of their act from those who do not, but does not require knowledge of the precise consequences that may flow from that act once aware that the act is wrongful”).

296 . See *Abrams v. United States*, 250 U.S. at 627 (Holmes, J., dissenting). That moral agency matters in an act-oriented approach to the First Amendment ought not be surprising. See generally Christina Wells, *Reinvigorating Autonomy: Freedom and Responsibility in the Supreme Court’s First Amendment Jurisprudence*, 32 Harv. C.R.-C.L. L. Rev. 159 (1997); David Dow, *The Moral Failure of the Clear and Present Danger Test*, 6 Wm. & Mary Bill of Rts J. 733 (1998).

297 . See *United States v. Edler Indus. Inc.*, 579 F.2d 516, 519-21 (9th Cir. 1978) (noting that in order to prevent ITAR restrictions on information with both peaceful and military applications from “imped[ing] scientific research and publishing and . . . international scientific exchange,” defendant “must know or have reason to know that its information is intended for the prohibited use”).

298 . See *Claiborne*, 458 U.S. at 918-19. The Court in *Claiborne* relied heavily on older cases upholding the constitutionality of a statute criminalizing membership in group that advocates overthrow of government by violence with knowledge of and specific intent to further the illegal aims. See *Noto v. United States*, 367 U.S. 290 (1961) (reversing conviction for insufficient evidence); *Scales v. United States*, 367 U.S. 203 (1961) (finding sufficient evidence to uphold conviction for being member of Communist Party).

299 . See *Claiborne*, 458 U.S. at 920.

300 . See *id.* at 919-20.

301 . See *Ohralik v. Ohio State Bar Ass’n*, 436 U.S. 447, 456 (1978).

302 . See *Yates v. United States*, 354 U.S. 298, 320-21 (1957) (distinguishing “between advocacy of forcible overthrow as an abstract doctrine and advocacy of action to that end” and holding that mere doctrinal justification of forcible overthrow was “too remote from concrete action”).

303 . 15 C.F.R. § 744.9 (1996).

304 . See *Thomas v. Collins*, 323 U.S. 516, 547 (1945) (Jackson, J., concurring) (noting that “[m]odern inroads on

[First Amendment] rights come from associating the speaking with some other factor which the state may regulate so as to bring the whole within official control”).

305 . See Geoffrey Stone, *Content-Neutral Restrictions*, 54 U. Chi. L. Rev. 46, 48-51 (1987) (identifying seven different standards of review that lead to three levels of scrutiny for content-neutral regulations).

306 . See, e.g., *R.A.V. v. City of St. Paul*, 505 U.S. 377, 386 (1992) (finding a “noisy sound truck” to be a nonspeech element similar to the characterization of fighting words).

307 . See *Madsen v. Women’s Health Center, Inc.*, 512 U.S. 753, 763 (1994). *But see Minneapolis Star & Tribune Co. v. Minnesota Comm’r of Revenue*, 460 U.S. 575, 592 (1983) (stating that “[i]llicit legislative intent is not the sine qua non of a violation of the First Amendment”); *accord Simon & Schuster v. New York State Crime Victims Bd.*, 502 U.S. 105, 117 (1991).

308 . *Ward v. Rock Against Racism*, 491 U.S. 781, 791 (1989) (stating that it is “justified without reference to the content of the regulated speech”). The Court often uses an alternative formulation—“whether the government has adopted a regulation of speech because of disagreement with the message it conveys”—but this seems quite different. *Id.* at 791.

309 . See *Renton v. Playtime Theatres, Inc.*, 475 U.S. 41, 48 (1986).

310 . See, e.g., Williams, *supra* note 268, at 617-18 (finding that a narrow focus on content-based discrimination concentrated on government purpose ignores other types of discrimination resulting in “systematic underprotection of speech and serious doctrinal confusion”); Keith Werhan, *The O’Briening of Free Speech Methodology*, 19 Ariz. St. L.J. 635, 649-58 (1988) (criticizing Court’s use of O’Brien balancing for direct as opposed to incidental content-neutral restrictions); David S. Day, *The Incidental Regulation of Free Speech*, 42 U. Miami L. Rev. 491, 529-30 (1988) (concluding that O’Brien doctrine is a failure and raises danger that Court will review more content-based restrictions under intermediate scrutiny). On the other hand, some commentators argue that intermediate scrutiny is internally incoherent. See, e.g., Larry Alexander, *Trouble on Track Two: Incidental Regulations of Speech and Free Speech Theory*, 44 Hastings L.J. 921 (1993) (arguing that intermediate scrutiny requires courts to value speech, which is inconsistent with the First Amendment).

311 . See Stone, *supra* note 305, at 48-51 (“When a restriction is content-based, the risk of improper motivation is especially high . . .”). A recent article revives and expands on Professor Stone’s basic insight that concern for illicit government purpose underlies the general shape of First Amendment analysis. See generally Elena Kagan, *Private Speech, Public Purpose: The Role of Governmental Motive in First Amendment Doctrine*, 63 U. Chi. L. Rev. 413, 414 (1996) (“First Amendment law, as developed by the Supreme Court over the past several decades, has as its primary, though unstated, object the discovery of improper governmental motives.”).

312 . See Williams, *supra* note 268, at 618 (“As a general rule . . . noncommunicative effects will usually be independent of the message.”). The obvious rejoinder is that every speech act is unique and that ostensibly noncommunicative aspects of the act, like its time, place or manner are often integral to the act’s propositional meaning and illocutionary force. Williams attempts to use the concept of the “facilitative” aspects of speech acts to create distinctions within the broad category of noncommunicative aspects. In her view, for instance, regulation of either expressive or facilitative aspects of speech acts are not “indirect” or “incidental” regulation. See *id.* at 723.

313 . My use of the term “content” here includes other bases for discrimination that the Court has found to trigger strict scrutiny, such as discriminating among speakers and media or format. Medium-based discrimination doesn’t always trigger strict scrutiny, but it can. *See id.* at 620.

314 . *See generally* 15 C.F.R. § 774 (1996) (setting forth categories of items subject to EAR).

315 . 15 C.F.R. § 734.3 (1996).

316 . 15 C.F.R. § 774 (1996) (“Encryption software is controlled because of its functional capacity, and not because of any informational value of such software; such software is not accorded the same treatment under the EAR as other ‘software’ . . . . Encryption software controlled for EI reasons under this entry remains subject to the EAR even when made publicly available in accordance with part 734 of the EAR . . . .”).

317 . *See* 15 C.F.R. § 744.9(a) (1996). No comparable restriction exists for other information subject to the EAR.

318 . *See City of Ladue v. Gilleo*, 512 U.S. 43, 52 (1994) (“Exemptions from an otherwise legitimate regulation of a medium of speech may be noteworthy for a reason quite apart from the risks of viewpoint and content discrimination. They may diminish the credibility of the government’s rationale for restricting speech in the first place.”). The government might argue that the act of communicating information intending to assist someone in writing encryption software conveys capacity as much as conveying the software itself. But this argument undermines the entire functionality premise: the government would have to admit that its concern is with the effects of the act, not the functionality of the thing being conveyed.

319 . 408 U.S. 92 (1972).

320 . *See id.* at 92.

321 . *See generally* *Stone*, *supra* note 270. *Cf. Mosley*, 408 U.S. at 95 (“The central problem with Chicago’s ordinance is that it describes permissible picketing in terms of subject matter.”).

322 . That the government regulates cryptographic technical assistance—which needn’t involve conveying a “functional” item—makes it even clearer that it targets cryptography as a subject.

323 . The Court in *Mosley* “proceeded on the assumption that subject-matter restrictions are to be treated no differently than other sorts of content-based restrictions.” *Stone*, *supra* note 270, at 86. In later cases, the Court “had considerable difficulty . . . with restrictions that, although content-based, are defined in terms of expression about an entire subject rather than a particular viewpoint or idea.” *Id.* at 99. Matters are not much clearer today. In *City of Cincinnati v. Discovery Network, Inc.*, 507 U.S. 410 (1993), the Court easily found regulations that banned only newsracks dispensing commercial handbills to be content-based for the “commonsense” reason that “whether any particular newsrack falls within the ban is determined by the content of the publication resting inside that newsrack.” *Id.* at 429. On this reasoning, the encryption export regulations are obviously content-based.

324 . This theme is clearest in cases of medium-based discrimination. *See City of Ladue v. Gilleo*, 512 U.S. 43, 55

(1994) (“Although prohibitions foreclosing entire media may be completely free of content or viewpoint discrimination . . . by eliminating a common means of speaking, such measures can suppress too much speech.”).

325 . See Williams, *supra* note 268, at 624-28 (discussing government purpose).

326 . See *City of Ladue v. Gilleo*, 512 U.S. at 60 (O’Connor, J., concurring) (“[C]ontent-based speech restrictions are especially likely to be improper attempts to value some forms of speech over others, or are particularly susceptible to being used by the government to distort public debate.”); Stone, *supra* note 305, at 217-27.

327 . See Stone, *supra* note 270, at 108 (“In general, one is more likely to be hostile to speech espousing a specific point of view than to speech about an entire subject.”).

328 . See *id.* at 109.

329 . See *id.* at 112.

330 . See *id.*

331 . Some subject-matter restrictions may in fact have content-differential effects, but the effects are likely to be spread across a wide range of issues, making an illicit government motivation unlikely. In contrast, restrictions on specific subjects are so focused that the likelihood of government preference is high. See Stone, *supra* note 270, at 81, 109-12.

332 . See Geoffrey R. Stone, *Content Regulation and the First Amendment*, 25 Wm. & Mary L. Rev. 189, 232 (1983). Professor Stone’s analysis focuses on concerns about distortion of public debate, equality, communicative impact, and illicit government motivation. He ultimately concludes that improper motivation is the most important issue. For a more recent, similar view, see generally Kagan, *supra* note 311, at 431-32 (“This inquiry tests whether the government regulated, even in part, on the basis of ideas as ideas, rather than on the basis of material harms.”).

333 . See Kagan, *supra* note 311, at 428-29 (arguing that harms to government “self-interest” are not cognizable as First Amendment harms). The government expressly preferred so-called “recoverable” encryption, which was designed to permit law enforcement officials access to the plain text of encrypted messages. Obviously, this preference can be explained in terms of functionality: Such encryption doesn’t function to frustrate government surveillance. Just as obviously, a person who believes that the government shouldn’t be able to decrypt encrypted messages easily would be less likely to write recoverable encryption software.

334 . See *City of Lakewood v. Plain Dealer Publ’g Co.*, 486 U.S. 750, 759 (1988) (noting that discretionary licensing schemes make it difficult for courts to “detect[], review[], and correct[] content-based censorship”). For the encryption export regulatory scheme to work, the government “must necessarily examine the content of the message conveyed.” *Forsyth City v. The Nationalist Movement*, 505 U.S. 123, 134 (1992) (quoting *Arkansas Writer’s Project, Inc. v. Ragland*, 481 U.S. 221, 230 (1987)).

335 . Indeed, functionality-based regulation of all software would seriously distort discourse not only in computer science but in every other discipline that uses software. See Stone, *supra* note 305, at 58 (arguing that for content-

neutral regulation, the central concern is “the extent to which a challenged law actually interferes with the opportunities for free expression”). Interference with opportunities, in turn, turns on two factors: the total quantity of debate, and interference with the speech of “particular groups, individuals, or causes.” *Id.* at 59. Regulation of all software might be neutral as to content, but would “unduly constrict the opportunities for free expression.” *Id.* at 58 (footnote omitted). *See also* *Martin v. City of Struthers*, 319 U.S. 141, 145 (1943) (noting that though a method of speaking may be “a blind for criminal activities, [it] may also be useful [to] members of society engaged in the dissemination of ideas in accordance with the best tradition of free discussion”).

336 . *See* *Kagan*, *supra* note 311, at 419-20 (noting that while a restriction on racist fighting words will cause some distortion of protected discourse, “the concern with skewing the deliberative process continues to ring oddly, as it might if a law prevented one side of a debate from throwing brickbats at the other . . . there is something peculiar in saying that . . . the law harms the thinking process of the community”).

337 . *See* *Ward v. Rock Against Racism*, 491 U.S. 781, 791 (1989) (“A regulation that serves purposes unrelated to the content of the expression is deemed neutral . . .”) (citation omitted).

338 . I ignore the *O’Brien* scenario, which involves a very specific setting: “when ‘speech’ and ‘nonspeech’ elements are combined in the *same course of conduct*.” *United States v. O’Brien*, 391 U.S. 367, 376 (1968) (emphasis added). On the Court’s analysis, burning the draft card was the very act that frustrated the government’s interest in preventing the destruction and assuring the continued availability of draft cards and the harm would exist even if the card were burned in private. Because the effects flow from the act itself, and not through any other person, *O’Brien* raised no issues of causation or moral agency. *See also* *Cohen v. California*, 403 U.S. 15, 18 (1971) (“[t]he only ‘conduct’ which the state sought to punish is the fact of communication. Thus, we deal here with a conviction resting solely upon ‘speech’”). I also ignore doctrines that focus on a medium’s own effects, as in the sign cases. *See* *City of Ladue v. Gilleo*, 512 U.S. 43, 48 (1994) (“Unlike oral speech, signs take up space and may obstruct views, distract motorists, displace alternative uses for land, and pose other problems that legitimately call for regulation. . . . [G]overnments may regulate the physical characteristics of signs. . . .”). The arguments about encryption software have nothing to do with medium effects.

339 . If, on the other hand, the harm is attributable to the communicative content, then the regulation aims at a “primary effect” or “direct impact,” and is therefore content-based and subject to strict scrutiny. *See* *Post*, *supra* note 9, at 1265. Outside the context of sexual speech, the Court has not upheld any regulation under the secondary effects doctrine. But cases like *Boos v. Barry*, 485 U.S. 312 (1988), and *Forsyth County, Ga. v. Nationalist Movement*, 505 U.S. 123 (1992), suggest that the Court might do so. *See* *Kagan*, *supra* note 311, at 483 n.190 (1996); *Williams*, *supra* note 268e, at 633 (predicting that “an affirmative response by a majority of the Court may not be far off”).

340 . *See* *Post*, *supra* note 9, at 1266.

341 . *See* *Williams*, *supra* note 268, at 630.

342 . *See* *Forsyth County, Ga. v. Nationalist Movement*, 505 U.S. 123, 134 (1992).

343 . *See* *Linmark Assoc., Inc. v. Township of Willingboro*, 431 U.S. 85, 94 (1977).

344 . *See* *Renton v. Playtime Theatres, Inc.*, 475 U.S. 41, 44 (1986) (finding that zoning ordinance designed to

prevent the occurrence of harmful effects like the crime associated with adult entertainment by protecting approximately 95% of the city's area from the placement of adult movie theaters); *Young v. American Mini Theatres, Inc.*, 427 U.S. 50, 71 n. 34 (1976) (Stevens, J., plurality op.) (“It is this secondary effect which these zoning ordinances attempt to avoid, not the dissemination of ‘offensive’ speech.”).

345 . *See Post, supra* note 9, at 1267. Professor Williams argues that “[a] drop in property values is . . . a noncommunicative harm” in the sense that “[e]ven if all . . . who entered the ‘adult’ theater were deaf and blind . . . the property values in the neighborhood . . . would still drop as long as the business continued to operate.” Williams, *supra* note 268, at 631. This fanciful hypothetical makes no sense, since there’s no reason to expect that any deaf and blind persons would even enter the theater, and in turn no reason to believe that this could be the city’s purpose. Choosing to see a movie because it is an “adult” movie is as much a “reaction” to speech as being offended by viewing it. Indeed, Williams herself concludes that the ban on solicitation in *United States v. Kokinda*, 497 U.S. 720 (1990), was not justified by the non-communicative effect of congestion and inconvenience caused by solicitation because “[i]f the solicitation took place in a language unknown to the listeners, then no one would stop to give money to the speaker.” *Id.* at 634 n.85. Obviously, deaf and blind theater patrons and linguistically incompetent potential donors are analytically identical in these examples.

346 . 485 U.S. 312 (1988) (O’Connor, J., plurality op.).

347 . *See Boos*, 485 U.S. at 320. In *Barnes v. Glen Theatre, Inc.*, 501 U.S. 560 (1991), Justice Souter suggested in his concurrence that it is “possible” that a “higher incidence of prostitution and sexual assault in the vicinity of adult entertainment locations results from the concentration of crowds of men predisposed to such activities, or from the simple viewing of nude bodies regardless of whether those bodies are engaged in expression or not.” In neither case “would the chain of causation run through the persuasive effect of the expressive component of nude dancing.” *Id.* at 586. But this formulation merely hypothesizes a causal chain and would force speakers to disprove it. In contrast, the Court in *Linmark* put the burden on the township to demonstrate that the effects it feared were secondary, concluding that “respondents have not demonstrated that the place or manner of the speech produces a detrimental ‘secondary effect’ on society.” *Linmark Assoc., Inc. v. Township of Willingboro*, 431 U.S. 85, 94 (1977).

348 . *Boos*, 485 U.S. at 320-21 (giving examples of congestion, visual clutter, and interference with ingress and egress).

349 . One critic observes: “If taken seriously, and extended to other contexts, the Court’s transmogrification . . . of an expressly content-based restriction into one that is content-neutral threatens to undermine the very foundation of the content-based/content-neutral distinction.” Stone, *supra* note 305, at 116.

350 . *See Post, Recuperating, supra* note 9, at 1266 (quoting John Hart Ely, *Democracy and Distrust: A Theory of Judicial Review* 111 (1980)).

351 . *See Kagan, supra* note 311, at 486 (“[T]he government almost always can proffer a justification based on [noncommunicative] harm.”).

352 . *See id.* at 487.

353 . *See id.* at 488-89.

354 . *See id.* at 489 (“[I]n *Simon & Schuster*, the Court asked why the statute covered only the profits criminals gained from expressive activity, when the profits gained from nonexpressive activity also could have compensated victims of crime.”).

355 . 15 C.F.R. § 734.3 (1996).

356 . One might argue that publishing printed source code isn’t identical to publishing source code in electronic form, or that the harms from the latter are significantly greater than from the former.

357 . In particular, the encryption regulations cover hardware. *See Bernstein IV*, 176 F.3d 1132, 1149 (9th Cir. 1999) (Nelson, J., dissenting) (“the EAR regulates the export of encryption technology generally, whether it is software or hardware”).

358 . It is properly applied if we look at the EAR’s treatment of all exports, not only encryption exports.

359 . 15 C.F.R. § 734.3 (1996).

360 . *See Kagan, supra* note 311, at 489 n.202 (“[I]f a noncommunicative aspect of speech attaches to all speech of a certain content, then the control group I am positing in secondary effects cases will not exist.”).

361 . *See, e.g., Schneider v. State (Town of Irvington)*, 308 U.S. 147, 162 (1939) (holding that the state’s legitimate interest in keeping streets free of litter “insufficient to justify . . . prohibit[ing] a person rightfully on a public street from handing out literature to one willing to receive it,” but no objection to punishing recipients “who actually throw papers on the street”).

362 . The heckler’s veto cases raise a similar issue. *See Kagan, supra* note 311, at 461 (“In the typical case, a speaker expresses certain ideas, an audience makes known its displeasure, and police officers, fearful of public disturbance, arrest the speaker.”).

363 . *See, e.g., Schneider v. State (Town of Irvington)*, 308 U.S. 147, 162 (1939); *Cohen v. California*, 403 U.S. 15 (1971).

364 . 403 U.S. 15 (1971) (overturning conviction for disorderly conduct based on wearing jacket bearing words “Fuck the Draft” in courthouse).

365 . *See Cohen*, 403 U.S. at 18 (finding that the conviction rested “solely upon ‘speech,’ not upon any separately identifiable conduct which allegedly was intended by Cohen to be perceived by others as expressive of particular views but which, on its face, does not necessarily convey any message and hence arguably could be regulated without effectively repressing Cohen’s ability to express himself”).

366 . 44 *Liquormart, Inc. v. Rhode Island*, 517 U.S. 484, 512 (1996) (“[T]he First Amendment makes clear that the Constitution presumes that attempts to regulate speech are more dangerous than attempts to regulate conduct”); *see*

Williams, *supra* note 268, at 641.

367 . *See* Riley v. National Federation of the Blind of N.C., Inc., 487 U.S. 781, 796 (1988) (“[W]here . . . the component parts of a single speech are inextricably intertwined, we cannot parcel out the speech, applying one test to one phrase and another test to another phrase. . . . we refuse[] to separate the component parts of charitable solicitation from the fully protected whole.”).