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Constructing contentious and noncontentious facts: How gynecology textbooks create certainty around pharma-contraceptive safety

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**Abstract**

Using critical discourse analysis, we examine how seven popular gynecology textbooks use sociolinguistic devices to describe the health effects of pharma-contraception (intrauterine and hormonal methods). Though previous studies have noted that textbooks generally use neutral language, we find that gynecology textbooks differentially deployed linguistic devices, framing pharma-contraceptive benefits as certain and risks as doubtful. These discursive strategies transform pharma-contraceptive safety into fact. We expand on Latour and Woolgar's concept of noncontentious facts by showing how some facts that are taken for granted by the medical community still require discursive fortification to counter potential negative accusations from outside the profession. We call these *contentious facts*. Our findings suggest that a pro-pharma orientation exists in gynecology textbooks, which may influence physicians' understanding of pharmaceutical safety. As such, these texts may affect medical practice by normalizing pharma-contraceptives without full considerations of their risks.

**Keywords**

contraception, pharmaceuticalization, fact construction, medical textbooks, modalities

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## Contraception and contentious facts

Approximately 67% of US women using reversible contraception rely on either short-acting hormonal methods or long-acting reversible contraceptives (LARC) (Daniels et al., 2015). This widespread acceptance is, in part, due to the pharmaceuticalization of family planning: "the process by which" fertility is managed "or deemed to be in need of treatment with medical drugs" or implanted devices (Abraham, 2010: 604). One of the most fundamental contributors to pharmaceuticalization is the construction of safety claims – declarations that drugs or devices are safe. The certainty and persuasiveness of safety claims is particularly important for the legitimacy of pharmaceuticals that have significant iatrogenic potential. For example, concerns that have arisen about adverse effects of hormonal contraception (e.g., blood clots, strokes, cancer) and intrauterine devices (e.g., uterine perforation, pelvic inflammatory disease, excessive bleeding) have been mitigated by campaigns to reestablish their safety for widespread use (Clarke, 1998; Geampana, 2016; Watkins, 2011).

Industry influences the construction of safety claims by emphasizing the efficacy and safety of pharmaceuticals while downplaying their risks (Abraham, 2008; Busfield, 2010). This interest-based bias (Abraham, 1993; Abraham, 1994) has been documented in clinical trials and regulatory approval (Segal, 2018), post-market controversies (Geampana, 2016; Timmermans

and Leiter, 2000), and the clinical encounter (Littlejohn and Kimport, 2017; Stevens, 2018). Underexplored are ways that it may permeate medical textbooks, which are assumed to contain 'factual' information (Kuhn, 1962; Latour and Woolgar, 1986; Martin, 2001). As such, the existence of biased safety claims in medical textbooks could contribute to a pharmaceuticalized orientation among physicians.

Drawing on constructivist theoretical traditions and employing analytic categories developed by various sociolinguists, we use critical discourse analysis to explore the presence of pharmaceutically oriented claims in seven widely used gynecology textbooks. Specifically, we examine the claims these textbooks construct regarding health effects of short-acting hormonal and LARC methods, i.e., *pharma-contraception*. We compare descriptions of health benefits versus health risks to 'delineate the extent to which some statements appeared more fact-like than others' (Latour and Woolgar, 1986: 76). Previous studies have noted that textbooks generally used neutral, factive language (MacDonald, 2002). However, we found that gynecology textbooks differentially used linguistic devices to frame health benefits as certain and health risks as doubtful, discursively transforming pharma-contraceptive safety into a fact. We draw on Latour and Woolgar's (1986) discussion of statement types to show how some facts that are taken for granted by members of the profession still require fortification to counter potential negative accusations from the outside. We call these *contentious facts*.

*Constructing certainty and doubt: A discursive exercise in fact-making*

Latour and Woolgar (1986: 76) explore how facts are constructed through 'literary inscription' – the 'various processes of writing and reading'. They argue that the purpose of literary inscription is 'the successful persuasion of readers' and examine how linguistic devices affect the persuasiveness, or 'facticity', of scientific statements (Latour and Woolgar, 1986: 76). The use of

modalities in scientific discourse can 'enhance or detract from the fact-like status of the statement', making claims seem more or less certain (Latour and Woolgar, 1986: 80). 'Diminishing modalities', which linguists call *hedges*, such as may or could, 'undercut the facticity' of claims (Latour and Woolgar, 1986: 76-77, 85). Consider the reduction in certainty that accompanies hedges: *x* causes *y* [no hedge], *x* may cause *y* [one hedge], *x* could cause *y*, but it is unlikely [three hedges]. Hedging allows for various 'speculative possibilities', whereas sentences without hedges make clear the relationship between two items (Hyland, 2006: 696).

Other modalities, such as extremely, many, or several, are elements of discourse that 'enhance the acceptance of a statement' (Latour and Woolgar, 1986: 80). These *boosters* 'emphasize the force of propositions' and assert 'the writer's conviction' (Hyland, 1998: 353). Certainty markers, such as clearly and obvious, are boosters that 'express writers' full commitment to the truth-value of the proposition' (Koutsantoni, 2004: 166). Consider the amplification in certainty that accompanies the introduction of a booster: *x* causes *y* [no booster], *x* clearly causes *y* [booster]. The use of 'clearly' indicates author commitment to the certainty of this claim. In short, modalities are an 'expression of the weight of a statement' (Latour and Woolgar, 1986: 84), indicating authors' attitudes about claims woven into their literary inscription (Koutsantoni, 2004).

While modalities can be used to portray the accurate state of scientific evidence (e.g., hedges can describe weak correlations), a central assumption of critical discourse analysis is that discourses do "more than…designate things" (Foucault, 2002: 54). For Foucault, scientific discourses are contextualized within existing political, economic and ideological power structures. By examining how linguistic devices are patterned in discourse-production processes,

researchers can expose “the reproduction of ideology and hegemony in such processes” (Lupton, 1992: 145). A key site for the production of scientific discourse is the textbook.

*Textbooks: Vehicles for the delivery and construction of standard medical knowledge*

Textbooks play a central role in both the delivery and construction of dominant medical discourses. They present medical students with ‘an already articulated set of problems, data, and theory’ based on ‘the particular set of paradigms to which the scientific community is committed’ (Kuhn, 1962: 136). Textbooks are seen as the ultimate ‘source of authority’, acting as ‘pedagogic vehicles for the perpetuation of normal science’ (i.e., taken-for-granted ideas, technology and procedures) (Kuhn, 1962: 135-136). Thus, textbooks dispense medical knowledge by inculcating students into existing discourses.

Simultaneously, textbooks construct medical knowledge through their ‘selection, reproduction and condensing’ of all the possible findings published in research articles (MacDonald, 2002: 452). This process limits and filters information that medical students receive by erasing evidence of scientific debates that occurred previously (Kuhn, 1962). Facts become ‘stabilized’, ‘reified’ and ‘more difficult … to doubt’ once they appear in textbooks (Latour and Woolgar, 1986: 243). They are ‘turned into something that closely resembles an organised whole’ that is cohesive and widely accepted by members of the discipline (Latour, 1987: 131). As such, the information in medical textbooks has entered a ‘black box’; it is seen as objective, factual, and requiring no scrutiny (Latour, 1987).

This sense of objectivity in medical textbooks is maintained by the linguistic patterns they commonly employ. Compared to research articles, textbooks generally contain more statements, that ‘are not qualified [and] do not contain a modality’ (Horn, 2001: 1087). The abundance of ‘unmodified assertions’ (Myers, 1992: 9) in medical textbooks gives the

impression of objectivity by implying that these claims are 'self-evident' (MacDonald, 2002: 457). However, like all discourses, those constructed in medical textbooks are rooted in powerful ideologies (Foucault, 1980; Martin, 2001). A pro-pharma ideological orientation within the medical profession could influence textbook descriptions of the risks and benefits of pharma-contraceptives.

*Pharmaceutical optimism in medical practice*

As agents of pharmaceuticalization, physicians and other healthcare providers tend to promote the safety of pharmaceuticals with their patients (Busfield, 2010). In the case of contraceptive counselling, healthcare providers selectively discuss the risks and benefits of pharma-contraception (Dehlendorf et al., 2014; Fisher and Todd, 1986). For example, Littlejohn and Kimport (2017: 443) found that providers differentially constructed less serious side effects (e.g., cramping, headaches) as 'improbable relative to positive side effects' and contested serious adverse outcomes (e.g., stroke, blood clots, infection) by describing them as 'negligible and controllable'. Similarly, Stevens (2018) noted that women's concerns about adverse contraceptive effects were often interpreted by healthcare providers as 'myths' because their experiences were inconsistent with formal medical knowledge. These providers placed trust in the value of pharma-contraceptives, displaying what Busfield (2010) described as a 'culture of optimism': physicians see the risks of pharmaceuticals 'as a price worth paying for the benefits', which leads 'negative evidence to be largely discounted' and the 'risks associated with medicines to be downplayed' (Busfield, 2010: 937-38).

Much of the literature exploring factors contributing to this pharma-centric optimism focuses on the pharmaceutical industry's efforts to influence physicians directly (Wadmann, 2014), starting in medical school (Holloway, 2014). In addition to gifts, medical students are

likely to be exposed to pharma-sponsored lectures, professors who receive industry funding, and free samples in teaching clinics (Holloway, 2014). Unexamined, however, is how pro-pharma bias may be woven into the fabric of textbooks, educational materials considered objective. Because physicians' instruction in pharmacology is generally limited (Busfield, 2010), the safety claims in gynecology textbooks could play a central role in physicians' understanding of the risks and benefits of pharma-contraception. As such, gynecology textbooks are key artifacts of pharmaceuticalization, deserving close examination for their potential role in constructing a culture of optimism.

To assess if safety claims made by gynecology textbooks contribute to a culture of pharma-optimism, we considered two main questions. First, what discursive techniques do gynecology textbooks use to construct certainty and/or doubt around pharma-contraceptive safety? Second, do these discursive techniques display a pro-pharma orientation?

**Methodology**

Data for this research derive from the contraception chapters of seven popular gynecology textbooks (see Appendix). To obtain this list, we randomly sampled fifteen US medical schools and contacted their bookstores. We selected the seven titles most recurring among the schools that were available through inter-library loan. From the contraception chapters, we sampled the 992 sentences (24,029 words) that pertained to adverse or beneficial health effects of pharma-contraceptive methods, including hormonal and copper IUDs, and oral, injectable, implantable, transdermal (patch) and vaginal (ring) forms of hormonal contraception.

Using critical discourse analysis, we examined how textbooks constructed claims regarding the risks and non-contraceptive health benefits of pharma-contraception. Our analysis began in an exploratory manner. As the themes of certainty, doubt and contesting repeatedly

arose, we used them as 'points of departure' to determine our qualitative codes and quantitative variables (Charmaz, 2014). Our goal was to measure the 'extent to which [a risk or benefit] appeared … fact-like' (Latour and Woolgar, 1986: 76). Specifically, we examined how textbooks used modalities and other linguistic devices to create a sense of certainty or doubt about the existence and importance of pharma-contraceptive risks and benefits. To augment our analysis of the various linguistic devices that emerged, we drew on the sociolinguistic literature and its robust array of analytic categories, including hedges, boosters, reporting verbs, clauses, show concessions and attitude markers.

*Hedges and boosters.* To measure discursive tentativeness, we analyzed several forms of hedges, including adjectives and adverbs (e.g., apparent(ly), presumab(ly), nouns (e.g., assumption, claim), and verbs (e.g., assume, may). To identify expressions of conviction and certainty, we coded for various boosters, such as clear(ly), many, and important(ly).

*Reporting verbs.* The verbs that authors employ to report scientific findings indicate their opinion about the validity and/or importance of those findings (Salager-Meyer, 1994). We compared how and when textbooks used *certainty verbs* versus *tentative verbs* (Thomas and Hawes, 1994). Certainty verbs (e.g., confirm, demonstrate, show) create confident assertions, suggesting that the author considers the information *factive*. Tentative verbs (e.g., imply, suggest, suppose) produce hesitant assertions, suggesting that the author considers the information *nonfactive* (Thompson and Yiyun, 1991). We coded verbs that were neither explicitly certain nor tentative as *neutral* (e.g., found, state, report).

*Clauses.* We examined how the presence of two or more clauses within a sentence affected the strength and/or direction of a claim. In particular, we focused on contrastive clauses,

which employ terms such as however, despite, and nonetheless (Fairclough, 2010). We observed whether these clauses had a hedging or intensifying effect.

*Show concessions.* Show concessions are a three-part rhetorical device that ‘bolsters the speaker’s case and weakens its counter’ (Antaki and Wetherell, 1999: 10). They entail stating (1) a proposition that is contrary to one’s perspective, (2) conceding to that point, but then (3) immediately returning with a counterpoint or reprise to undermine the concession. For example: X is associated with y [proposition]. This association is noteworthy [concession], but it is uncommon [reprise]. We recorded instances of this rhetorical structure that both strengthens and defends the author’s position by illustrating the invalidity of the proposition (Antaki and Wetherell, 1999).

*Attitude markers.* Attitude markers ‘express the writer’s affective attitude to propositions’ and can convey ‘surprise, obligation, agreement, importance, [and] frustration’ (Candlin and Hyland, 2014: 104). They can include adjectives (e.g., remarkable), adverbs (e.g., unfortunately), verbs (e.g., agree), and necessity modals (e.g., must, should) (Candlin and Hyland, 2014). We analyzed attitude markers for indication of authors’ positive or negative attitudes toward claims regarding pharma-contraceptive risks and benefits. Because attitude markers often overlap with other linguistic devices (e.g., importantly = booster & attitude marker), we do not report their quantitative outcomes except in the overall facticity variable.

*Overall facticity*. After assessing all six linguistic devices, we combined them to create an overall facticity variable – a summary measure indicating whether each sentence was ultimately constructing certainty or doubt. Sentences were coded *non-factive* if they contained hedging words or clauses, tentative reporting verbs, show concessions and/or negative attitude markers.

*Factive* sentences were devoid of hedging words/clauses and tentative reporting verbs, and may have used boosters, certainty reporting verbs, and/or positive attitude markers.

*Analysis*

To investigate how textbooks used these six linguistic devices to construct pharma-contraceptive safety claims, we engaged in systematic coding of every sentence. First, we entered all 992 sentences into a database and established whether each sentence pertained to a pharma-contraceptive risk or benefit. Then, we determined if each sentence was claiming that pharma-contraception was associated or not associated with the risk or benefit. Finally, we noted the presence or absence of the six rhetorical devices described above and how they were employed. For example, if a booster was present in a risk sentence, we considered whether its purpose was to emphasize the association or lack of association between pharma-contraception and the risk. We ensured inter-coder reliability by each reading a large sample of sentences to confirm coding decisions. To examine the extent to which these linguistic patterns existed throughout the chapters, we quantified the use and context of the linguistic devices and analyzed them with crosstabulations.

Our analysis employed the ‘textual intensification’ strategy of comparing language used to describe similar but distinct entities, i.e., risks and benefits of pharma-contraception (Martin, 2001; Tomlinson, 1999). Since both risks and benefits are detected with the same scientific protocols (Abraham, 2008), and medical textbooks tend to lack many ordinary ‘rhetorical features’ (MacDonald, 2002: 457), we would expect gynecology textbooks to employ few modalities and exhibit similar levels of discursive certainty regarding risks and benefits. According to the textual intensification model, if linguistic disparities exist between these two

entities, then their descriptions must be 'influenced by some nonscientific criteria' (Tomlinson, 1999: 17). The use of discursive techniques to downplay health risks and/or emphasize health benefits would constitute evidence of a pro-pharma orientation.

Our constructivist analysis makes no claims about the 'actual' existence of pharma-contraceptive risks/benefits. We assume that 'the products of science have to be seen as *highly internally structured* through the process of production, independent of the question of their external structuring through some match or mismatch with reality' (Knorr-Cetina, 1981: 5, emphasis in original). We also do not assess the 'actual' certainty of claims made by the textbooks, since, among other things, all scientific certainty emerges from a series of 'local uncertainties' (Star, 1985).

**Pharma-contraceptive safety as fact**

The gynecology textbooks in our sample contribute to the culture of pharma-optimism by differentially deploying modalities to frame pharma-contraceptive safety as certain and risk as doubtful. In their descriptions of benefits, textbooks employed *factive* language to affirm their existence and importance without qualification. This discursive pattern created a sense of certitude about these contraceptive methods' safety (see Table 1). Conversely, when describing risks, textbooks employed *counterfactive* language to construct doubt about risk and certainty about the lack of risk. This linguistic strategy combined the use of factive language to claim that pharma-contraceptives are not associated with risks and nonfactive language to uncut the existence and relevance of risks. This counterfactive rhetorical pattern simultaneously created doubt about risks' existence and certainty about their nonexistence. Together, the use of factive language to describe benefits and counterfactive language to describe risks constructed pharma-contraceptive safety as certain.

[TABLE 1 AND TABLE 2 ABOUT HERE]

*Constructing certainty: Transforming benefits into noncontentious facts*

Textbooks constructed certainty around pharma-contraceptive safety by emphatically affirming the existence and importance of benefits. Almost all benefit sentences claimed that pharma-contraceptives were associated with health benefits (96%) (see Table 2) and most of those sentences (89%) used factive language (see Table 3). Benefit sentences often lacked modalities, thereby suggesting that certainty is self-evident:

> Menstrual periods are predictable, shorter, and less painful and, as a result, the risk of iron-deficiency anemia is reduced [with use of oral contraception]. (Beckmann: 226)
>
> Both the copper and levonorgestrel IUDs [intrauterine devices] protect against ectopic pregnancy. (Gibbs: 578)

[TABLE 3 ABOUT HERE]

This certainty was often magnified with boosters (underlined below), which also served to highlight the importance of health benefits:

> The noncontraceptive benefits with DMPA [the shot] are <u>impressive</u>. (Hacker: 311)
>
> Because of the effectiveness of the LNG-20 IUD in reducing menstrual blood flow, it has been used for treatment of menorrhagia [abnormally heavy bleeding], a <u>significant</u> noncontraceptive benefit. (DeCherney: 942)

Attitude markers (impressive, significant) in these passages project authors' positive attitude toward the existence and importance of pharma-contraceptives.

When discussing health benefits, authors also generally employed certainty verbs to emphasize their commitment to the scientific validity of benefits (see Table 3):

> Randomized placebo-controlled trials have <u>demonstrated</u> a reduction in acne lesions with some oral contraceptive preparations (DeCherney: 933)

> These data confirm that the copper T 380A [IUD] reduces the risk of having both intrauterine and ectopic [outside uterus] gestations. (Lentz: 262)

The constant use of factive language affirmed the existence and importance of pharma-contraceptive health benefits. This consistent emphasis on certainty alleviated the need for explanation, thereby transforming benefits into noncontentious facts (i.e., well-known and unremarkable ideas) (Latour and Woolgar, 1986). Framing benefits as noncontentious facts was one key way that textbooks constructed certainty around the safety of pharma-contraceptives. The second was framing risks as nonexistent and irrelevant.

*Constructing certainty about doubt: Transforming lack-of-risk into a contentious fact*

The discursive patterns that textbooks used to describe risks differed considerably from the ways they portrayed benefits. First, fewer than 5% of sentences describing benefits claimed no association between pharma-contraception and those benefits. In contrast, textbooks devoted nearly half (44%) of risk sentences to explain how pharma-contraceptives did not cause harm (see Table 2). In addition, while textbooks employed factive language to construct certainty about the existence and importance of benefits, they used counterfactive language to construct certainty about the lack of risk. For example, nearly 77% of sentences claiming no association between risks and pharma-contraceptives used factive language, compared to 14% of benefit sentences (see Table 4, section C).

Counterfactive language employed factive linguistic devices to assert that pharma-contraception was not associated with risk, and nonfactive devices to create doubt about the relevance of risk (see Table 1). The following unqualified claims and boosters exemplify how textbooks used factive language to construct lack-of-risk as self-evident:

> In fact, they [oral contraceptives] do not increase the risk that women with a history of gestational diabetes will progress to overt diabetes. (Schorge: 111)

> Epidemiologic research confirms that the overall risk of serious cardiovascular complications attributable to COC [oral contraceptive] use is extremely low for the vast majority of users of the current low-dose ethinyl estradiol [artificial estrogen] preparations (<35 mcg). (Gibbs: 570).

The boosters (in fact, extremely, vast majority) and certainty verb (confirms) express authors' commitment to these claims that pharma-contraceptives are safe because the potential risks are essentially nonexistent.

The use of counterfactive language often emerged through the strategic combination of factive and nonfactive devices to assert the lack of risk in the same sentence:

> Although earlier studies suggested DMPA users gained an average of 5 lb after 1 year of use, a recent randomized clinical trial demonstrated that DMPA was not associated with significant weight gain or changes in variables that might lead to weight gain. (DeCherney: 939)

This example illustrates how counterfactive linguistic patterns construct certainty around doubting risk. The nonfactive contrastive clause (although) and tentative verb (suggested) downplayed the possibility of risk, while the factive certainty verb (demonstrated) and lack of hedge (was not) declared no association with pharma-contraception. The factive devices confirmed the doubt about risk created by the nonfactive devices.

[TABLE 4 ABOUT HERE]

The textbooks in our sample used three counterfactive discourses to assert the lack of risk. They transformed risks into benefits, rebutted disparaging allegations levied against pharma-contraception, and undercut the relevance of risks.

*Transforming risks into benefits.* Textbooks discursively transformed risks into benefits with the use of show concessions (Antaki and Wetherell, 1999). They first conceded the existence of risk using nonfactive language. Then they shifted to factive language to claim that

the risk was not relevant and pivoted to an explanation of how the originally-proposed risk actually had a beneficial effect:

> Placement of IUDs in women with cervical infections can lead to insertion-related pelvic inflammatory disease (PID). [concession of risk]
>
> This increased risk is now believed to be due to contamination of the endometrial cavity [gonorrhea or chlamydia] prior to insertion of the IUD at the time of insertion. Otherwise, pelvic infection is rarely seen beyond the first 20 days after insertion. [reprise – the woman's body, not the IUD, is the cause, otherwise risk is unlikely]
>
> …Moreover, studies now show that women using LNG IUDs have a decreased risk of PID owing to the protection of progesterone-induced cervical mucus thickening. [a benefit] (Callahan: 386)

The use of 'can' concedes the risk tentatively, 'rarely' emphasizes irrelevance of the risk, and 'show' emphasizes the author's commitment to the benefit claim. Sealing the discursive transformation from risk to benefit, the text defines the woman's body (contamination) rather than the IUD as the source of risk.

*Rebutting allegations.* Textbooks also asserted the lack of risk by proactively rebutting allegations raised by unidentified adversaries. The following preempts readers' skepticism or confusion about possible iatrogenic effects with a counter narrative (Hyland, 2005):

> Although IUDs are the most commonly used reversible method of contraception worldwide, their use in the United States has plummeted …. Much of the decrease in use of this long-term, highly effective method of contraception can be attributed to concerns about the risk of pelvic infections stemming from studies of IUDs in the 1970s. In particular, the Dalkon Shield IUD was associated with an increased risk of infection and was removed from the market in 1975. Today, pelvic infection among users of modern IUDs is primarily associated with exposure to sexually transmitted infections; the risk among IUD users at no risk for sexually transmitted infections is extremely low. (Gibbs: 577)

This passage dismisses fears about possible iatrogenic effects of IUDs using three rhetorical techniques. First, it uses boosters to emphasize IUDs' popularity (worldwide, most commonly) and the unlikelihood of pelvic infection (extremely unlikely). Second, it argues that IUDs' lack

of popularity in the United States is problematic with a contrastive clause (although), boosters (long-term, highly effective), and an attitude marker (plummeted). Third, it shifts causation from IUDs (today, modern) to users/women (sexually transmitted infections) and to a product that is no longer on the market (1970s, Dalkon). This counterfactive language confirms that readers should not believe allegations that IUDs may be dangerous.

The following two examples lament and rebut negative publicity directed toward oral contraception:

> It is unfortunate that the infrequent adverse effects of OCs have received widespread publicity, but the more common noncontraceptive health benefits have attracted little attention. (Lentz: 247).
>
> In general, oral contraceptives have *proven* to be safe for most women. The *possibility* of adverse effects from COCs has received *so much* attention for *so long* that clinicians as well as the public are *frequently* confused by the *often* conflicting reports. (Schorge: 110)

The attitude markers (it is unfortunate that, so much/so long) express the authors' frustration about the perceived negative reputation that pharma-contraception, in their estimation, has unfairly acquired. Boosters (widespread, proven) emphasize the problematic nature of the allegations, and hedges (infrequent, possibility) negate the notion that the allegations could be justified. By framing derogatory claims as baseless, these linguistic patterns constructed certainty around doubting risk. According to Latour (1987: 45, 43), rhetorical tactics such as these 'fortify' claims in order to 'withstand the assaults of a hostile environment' and fend 'off opposition by enrolling many other allies'.

*Undercutting the relevance of risks.* Finally, textbooks undercut the existence and relevance of risks. While benefit sentences overwhelmingly proclaimed the existence of health benefits using factive language, only 56% of risk sentences acknowledged the existence of risks

(see Table 2), and the vast majority of those (80%) employed nonfactive linguistic devices (see Table 4, section B). For example:

> It appears that oral contraceptives may accelerate the development of gallbladder disease in women who are susceptible …. (Schorge: 111)

Such use of hedges (may) and tentative reporting verbs (appears) creates doubt about the existence of risk.

In addition to employing nonfactive language to create doubt about the existence of risks, textbooks used factive language to construct certainty about the irrelevance of risk. Textbooks regularly asserted four reasons why pharma-contraceptive risks were unimportant. First, they described adverse effects as irrelevant by emphasizing that they are temporary:

> IUD removal is followed by rapid reversal and return to a normal intrauterine environment and normal fertility. (Beckmann: 232)

This factive statement is devoid of hedges, leaving no doubt about the temporality of the side effects.

Show concessions employed nonfactive language to concede risks, and factive language to frame risk as fleeting:

> There may be a very short delay in time to conception compared with women not using COCs based on the time required to begin ovulating. [concession]
>
> This delay is temporary, and by 3 to 12 months after discontinuation, there are no differences in fertility rates. [response] (Gibbs: 572).

This excerpt constructs certainty about doubting the relevance of risk by describing the possibility of delayed fertility as uncertain (may) while declaring its temporary nature as absolute (is, are).

Second, textbooks undercut the relevance of risks by describing them as surmountable. In the following excerpt, factive language explained that risks are effectively managed with simple actions like changing one's diet:

> An adequate diet <u>is sufficient</u> prophylaxis <u>against any</u> detrimental deficiency. [due to COCs] (Schorge: 113).

With words like '<u>is</u>' and '<u>any</u>', textbooks portray the efficacy of risks' antidotes as certain, suggesting that side effects are irrelevant because they can be easily remedied.

Textbooks also employed directives to explain how clinicians should help women navigate common side effects:

> If DMPA users gain weight, they <u>should be counseled</u> to decrease caloric intake and increase their exercise .... (Lentz: 252)
>
> Women <u>should be advised</u> to carry light-day panty liners to be prepared for the unscheduled bleeding and spotting [due to hormonal implant]. (Hacker: 309)
>
> Thus, calcium, vitamin D, weight-bearing exercise, and smoking cessation <u>should be encouraged</u> in all women using Depo-Provera [to address bone demineralization]. (Callahan: 394)

The modal obligation 'should' guides readers' attention (Hyland, 2005) toward remedies requiring women to compensate for adverse pharma-contraceptive effects by modifying their behavior, rather than considering non-pharmaceutical or male-body contraceptive options. In doing so, these statements not only outline clinical expectations, but also emphasize the manageability of side effects to illustrate their irrelevance.

Third, textbooks generally emphasized that frequently occurring side effects are unimportant because they are minor:

> Clinically <u>insignificant</u> reductions in circulating levels of the B complex vitamins and ascorbic acid and increases in levels of vitamin A have been reported …. (Lentz: 226)

> Minor side effects [of the IUD] include abnormal bleeding and cramping. (DeCherney: 942)

These examples acknowledge the existence of risk, but articulate that there is no need to be concerned about effects that are ‘minor’ and ‘insignificant’. Describing risks as temporary, surmountable, and minor normalizes adverse effects, portraying them as something that women and health care providers should consider permissible (see Timmermans and Leiter, 2000 for more on normalizing risks).

Finally, when describing the possibility of mortality or serious morbidity, textbooks tended to reference their infrequency as proof of irrelevance. Often, these statements we devoid of modalities:

> Neoplastic [tumor-related] complications of oral contraceptive use are rare. (Callahan: 390)

Other times, they strategically placed boosters to emphasize rarity and hedges to undercut likelihood and severity of risk:

> Benign hepatic [liver] tumors are an extremely rare problem, and symptomatic cholelithiasis [gallstones] and mild hypertension [high blood pressure] may be slightly increased’ [due to combined hormonal methods]. (Hacker: 310).

In this example, textbooks undercut the relevance of risks by framing their existence and importance as doubtful (mild, may, slightly) and their infrequency as certain (are, extremely).

Show concessions also framed risks as uncommon, often acknowledging a statistically significant risk, but emphasizing its unlikelihood:

> Although all of these complications [liver tumors, blood clots, limited flow of bile to liver, gallbladder disease, stroke, and heart attack] are from 2 to 10 times more likely in pill-users, they are still uncommon. [concession and reprise] (Beckmann: 226)

These linguistic formations contested the seriousness of adverse effects by framing them as unlikely to occur (Littlejohn and Kimport, 2017).

Using counterfactive language, textbooks constructed certainty about doubting the existence and relevance of risks. Textbooks undercut the facticity of risks by discursively transforming risks into benefits and rebutting allegations that pharma-contraception could be unsafe. They also declared with certainty that risks are uncommon, minor, temporary and surmountable, dismissing potential concerns as irrelevant. In doing so, textbooks transformed lack-of-risk into a contentious fact - a fact that requires periodic contestation of counter-claims to fortify its facticity.

**Contentious versus noncontentious facts**

Textbooks' use of factive language to affirm the existence and importance of pharma-contraceptive health benefits without qualification transforms health benefits into noncontentious facts (Latour and Woolgar, 1986). Counterfactive language, a combination of factive and nonfactive linguistic patterns that concurrently undercuts the existence of risks and asserts their irrelevance, transforms lack-of-risk into a contentious fact. Lack-of-risk is a 'fact' because it is taken for granted by healthcare professionals (Littlejohn and Kimport, 2017; Stevens, 2018), but its 'contentious' because it occasionally requires justification to convincingly contest counter-claims, maintain member solidarity, and train new professionals (see Geampana, 2016). Gynecology textbooks' construction of lack-of-risk assures medical students that pharma-contraception is safe to prescribe. Thus, the distinction between noncontentious and contentious facts is not in the commitment level among scientists/providers, but rather in the social and political context that compels professionals to proactively reinforce the fact-status of ideas to which they are committed (e.g., pharma-contraceptive safety).  The combination of these fact-claims legitimizes pharma-contraceptives by erasing doubt about their safety and demonstrating

gynecology's disciplinary commitment to them. These findings indicate a pro-pharma orientation within gynecology textbooks.

*Implications of constructing pharma-optimism*

Textbooks' transformation of pharma-contraceptive lack-of-risk into a contentious fact may contribute to the pharma-optimism observed in clinical encounters. Healthcare providers' commitment to the idea that pharma-contraceptives are safe and dismissiveness of women's concerns (Stevens, 2018) is consistent with how textbooks undercut the relevance of risk. In constructing lack-of-risk as a contentious fact, textbooks may encourage physicians to privilege these seemingly scientific claims rather than women's own experiences, despite evidence that women discontinue contraceptives due to these concerns (Littlejohn, 2013).

The construction of lack-of-risk as a contentious fact also has implications for medical research. Framing pharma-contraceptive risk as nonexistent and irrelevant could diminish researchers' incentive to develop alternative forms of contraception that are safer for women or that transfer the 'fertility work' from women to men (Bertotti, 2013; Kimport, 2017). Though women participating in trials for the pill have suffered graver health outcomes than have male participants, risk assessments used in these studies have tended to 'give more weight to side effects of male contraceptives than those to female methods', ultimately stalling development of a male pill (Oudshoorn, 2003: 108). As such, research on male-body contraceptives is unlikely to expand as long as female-body pharma-contraceptive risks are defined as unimportant.

The construction of certainty around pharma-contraceptive safety also contributes to the pharmaceuticalization of public health. Pharma-contraceptives have become the primary intervention promoted by government agencies to deter unintended pregnancy in many countries around the world. This widespread pharmaceuticalization of unintended pregnancy is based on

the assumption that pharma-contraceptive safety is certain, raising two potential problems. First, focusing on efficacy rather than safety limits women's contraceptive options by making pharma-contraception 'the only responsible contraceptive choice' (Mann and Grzanka, 2018: 17). Since LARC methods are disproportionately used by socially disadvantaged women, promoting them as the solution for unintended pregnancy could have important social control implications, defining who should and should not conceive along racial and socioeconomic lines (Metoyer, 2009; Volscho, 2011). Second, the pharmaceuticalization of unintended pregnancy reduces the scope of possible causes to focus on individual women, ignoring various cultural, socioeconomic and relational factors. For example, evidence suggests that how women feel about having a baby with a particular partner affects whether they want their pregnancies, and that socioeconomic forces affect women's access to such partners (Bertotti, 2018; Edin and Reed, 2005). Similarly, relational factors affect contraceptive decision-making (Soler et al., 2000). Thus, pharmaceuticalizing unintended pregnancy, rather than considering the role of relationships or other social factors, is unlikely to address the problem.

Further research would be necessary to determine whether the pro-pharma orientation of these textbooks can be attributed to direct 'ghost management' by the pharmaceutical industry (Sismondo, 2018), or simply an overarching pharma-optimistic medical paradigm (Kuhn, 1962). In addition, while evidence suggests that the pharma-optimism contained in these textbooks may influence clinical encounters (Littlejohn and Kimport, 2017; Stevens, 2018), our research cannot make this determination. Deeper investigation is necessary to explain how these textbooks both disseminate and construct knowledge about pharma-contraceptive safety and if they normalize the use of pharma-contraceptives without full consideration of their risks.

Although the sociological and sociolinguistic literatures suggest that textbooks contain primarily statements devoid of modalities, our analysis reveals that gynecology textbooks differentially deployed linguistic devices along ideological lines. By transforming benefits into noncontentious facts and lack-of-risk into a contentious fact, gynecology textbooks framed pharma-contraceptive safety as certain. These findings illustrate how linguistic devices can be used to subtly reinforce current dominant discourses and how contentious facts are mobilized to dissuade dissent. Thus, our research contributes to the understandings of how textbooks are subjective entities imbued with specific cultural and political discourses that reify dominant practices and ideas. This analysis also offers an additional layer of complexity to the knowledge-construction literature by introducing the notion of noncontentious facts and the observation that efforts to fortify facts can signal shared commitment among scientists and providers.

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## Appendix: Textbooks in Sample

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