

UNLOCKING ANCIENT TEXTS WITH NEW TOOLS: A DATA-CENTERED STUDY OF THE MISHNAH

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Introduction

The Mishnah, the third century foundational text of Jewish law, is generally believed to provide the earliest codification of Jewish oral law. Scholars have long analyzed the Mishnah through close readings. However, legal studies have shown that close readings are sometimes inadequate for understanding large and complex corpuses:¹ some questions require quantification, which itself requires a database of the entire corpus.² Here, the sheer scale of the Mishnah, more than 500 chapters comprised of more than 4,000 *Mishnayot*, has proven to be a serious obstacle to answering questions like who are the anonymous *Tannaim* (mishnaic era rabbinic sages, singularly “*Tanna*”) generally or how the Mishnah was compiled.

The literary theorist Franco Moretti teaches us that, for projects like these, “distance...*is a condition of knowledge*: it allows you to focus on units that are

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¹ Moretti, “Conjectures on World Literature,” 57-58, compares the strength and weaknesses of traditional scholarly close readings as compared to distant reading.

² Weinshall and Epstein, “Developing High-Quality Data Infrastructure for Legal Analytics,” 416. To be clear, scholars have made certain broad statements about the Mishnah. Indeed, the Mishnah itself impliedly recognizes Beit Shammai as generally strict and Beit Hillel as lenient (*Mishnah Eduyot* 4:1). The Talmud Bavli notes that some *Tannaim* are lenient in questions relating to *muqtzeh* (*Shabbat* 45a). And modern scholars have analyzed the differences in the approaches of various pairs of *Tannaim*—particularly Rabbi Akiva and Rabbi Yishmael as relates to certain specific values (Ilan, “Daughters of Israel, Weep for Rabbi Ishmael,” 26-28; Yadin-Israel, *Scripture and Tradition*, 1 (citing sources); Kahana, “The Good in the Sight of Heaven and Right in the Sight of Man”; Kurtzman, “*LiVerur Shitatam Shel Rabbi Shimon to Rabbi Yehuda*”; Cohen, *Mirrors of Eternity*. But these statements are not quantified in any way, they are limited to statements about pairs of *Tannaim*, and, in many cases, the claims are further limited to specific issues.

much smaller or much larger than the text”.³ Moretti himself is concerned with the question of what it means to study “world literature” when a human being cannot possibly read everything that has been written. Moretti’s primary insight is that “close readings”—i.e., “very solemn treatment of very few texts taken very seriously”—prevents one from understanding broader themes that go beyond these few texts. He therefore proposes what he calls a “pact with the devil” where one asks more basic questions (in his case, questions about relationships between texts) but of a much larger set of texts. As Moretti concludes, “the more ambitious the project, the greater must the distance be.”⁴ For our purposes, we made a smaller pact with the devil: we ignore the intricacies of any given Mishnah and instead focus on very general but quantifiable questions about arguments in the Mishnah.

To conduct our distant reading of the Mishnah, we built the first database of its 2,381 unique arguments. To do so, we manually went through the entire Mishnah, coding key parameters of each argument. (1) We began by coding which *Tannaim* are arguing. Beyond that, we classified arguments by type. Thus, (2) for arguments relating to religious observance, we coded which *Tanna* takes the stricter view. Analyzing arguments based on strictness/leniency is a natural choice given that the Mishnah acknowledges a tendency based on this parameter for arguments between Beit Hillel and Beit Shammai (*Mishnah Eduyot* 4:1). (3) *Seder Zeraim* largely focuses on charity (to the poor, Levites, and Priests). While, technically, that is a type of religious observance, to our sensibilities (although, as we show, not to the Mishnah’s) it seemed different in kind from standard religious observance, and thus we coded charity separately. (4) Certain laws, primarily in *Seder Nezikin*, relate to civil arguments, in which strict/lenient is an unnatural fit. For these arguments, we considered which *Tanna* required monetary payments and which did not (instead preferring to maintain the status quo). The significance of the status quo (*hazakah/hamotzi me-havero*) is also recognized in the Mishnah (*Bava Kamma* 3:11; *Bava Batra* 9:6; *Hullin* 10:4; *Taharot* 4:12), and the Talmud Bavli (*Bava Kama* 46a) even calls it a “significant principle”. It was thus a natural subdivision. (5) Finally, although we do not analyze this in any significant way here and while the rulings of Maimonides (the twelfth-century scholar famous for codifying all Jewish practice) do not necessarily reflect the approaches of the Mishnah’s authors or redactors themselves, our database records which *Tannaim* take precedence in Jewish practice as codified by Maimonides in his *Mishneh Torah* where available or in his commentary on the Mishnah where the *Mishneh Torah* is silent.⁵

³ Moretti, “Conjectures on World Literature”.

⁴ *Ibid.* at 57.

⁵ Maimonides’s decisions are sometimes disputed and, on occasion, Maimonides himself changed his views over the years. Since, in this work, we barely utilize this data, we will

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Using our new database, we show that the *Tanna Kama* (literally, “first Tanna”)⁶ regularly argues with Rabbis Shimon, Yehuda, and Yossi but argues with Rabbi Meir far less frequently. This is consistent with positions represented in both Talmuds in which various Amoraim identify the *Tanna Kama* as generally reflecting Rabbi Meir’s view. Conversely, the Mishnah presents numerous arguments between the *Hakhamim* and Rabbi Meir but very few arguments between the *Hakhamim*, on the one hand, and any of Rabbis Shimon, Yehuda, and Yossi, on the other. We propose that the reason the Mishnah treats Rabbi Meir differently than his contemporaries is because he is the default position (the *Tanna Kama*), and the Mishnah uses a different construct for presenting a normative position that argues with him.⁷

Our database also shows that the Mishnah is consistent in the relative frequency with which it cites various *Tannaim* (including the anonymous *Tannaim*). Epstein has already shown that different *Tannaim* have their preferred sources of authority: works compiled by students of Rabbi Akiva cite a different cast of *Tannaim* than those compiled by students of Rabbi Yishmael. Further, as Epstein notes, the Mishnah’s tendency to cite *Tannaim* of Rabbi Akiva’s school suggests that it generally comes from a single school.⁸ Additionally, as mentioned above, the Mishnah has a fairly consistent system for how it uses anonymous constructs to present arguments with the Ushan *Tannaim*⁹ (i.e., the Mishnah generally uses the construct of the *Hakhamim* to argue with Rabbi Meir, but it uses the *Tanna Kama* to argue with Rabbis Shimon, Yehuda, and Yossi). In contrast, there is no similar trend for pre-Ushan *Tannaim*: the Mishnah is as likely to contrast Rabbi Akiva’s position with the *Tanna Kama* as it is to contrast his position with *Hakhamim*. The consistency with which the Mishnah presents the Ushan *Tannaim* suggests that at least that stratum of the Mishnah was redacted with a single intention (perhaps even by a single person¹⁰).

not engage in a lengthier analysis of the pros/cons of relying on Maimonides in this manner.

⁶ Throughout this article, we will sometimes talk about the “*Tanna Kama*” and the “*Hakhamim*” as if they were individual people—no different than Rabbi Meir or Rabbi Yossi. This is simply a convenient shorthand for referring to the construct that the Mishnah is using.

⁷ This is akin to Goldberg, “The Mishnah: A Study Book of Halakha,” 219: “[A]nonymous presentations have nothing to do with suppression, but rather with selection.”

⁸ Epstein, *Mevo'ot le-Sifrut haTanna'im*, 520, 570.

⁹ Ushan *Tannaim* are *Tannaim* circa 150 c.e., and they are the most frequently cited *Tannaim* in the Mishnah. The most notable Ushan *Tannaim* are Rabbis Meir, Shimon, Yehuda, and Yossi.

¹⁰ Both Talmuds include statements (e.g., *Bavli Beitzah* 2b; *Yerushalmi Kiddushin* 3:12, 64c) suggesting that the redactor is “Rebbe”. Further, the Talmud assumes that the *Tanna* Rebbe in the Mishnah is Rabbi Yehuda haNasi (Epstein, *Mevo'ot le-Sifrut haTanna'im*,

Finally, we provide additional examples of the utility of our data in testing various categories of questions: like how attitudes of charity relate to attitudes of strictness and who compiled individual tractates of the Mishnah.

Methodology

Our database resembles the US Supreme Court database¹¹ and similar apex court databases. Legal scholars use these databases to make claims about broad trends in judicial decisions.¹² The US Supreme Court database includes, inter alia, (a) information on which Supreme Court justices are involved in a decision, (b) the direction of the justices' opinions (*e.g.*, pro- or anti-defendant), and (c) which justices prevail. Our respective analogy for the Mishnah is to code (a) which *Tannaim* are involved in a decision,¹³ (b) the direction of the *Tanna*'s opinions (*e.g.*, strict or lenient), and (c) which *Tanna* prevails.¹⁴ We manually went through the Mishnah, coded every argument along the various parameters described above, and then used computers to collate the data to show who argues with whom and what attitudes they tended to take in these arguments. We provide additional details on the construction of our database in Appendix A.

Results

There are 2,381 arguments in the Mishnah (for an average of 4.55 arguments per chapter of Mishnah). While these arguments involve more than a hundred named *Tannaim*, not all *Tannaim* appear with equal frequency. Most *Tannaim* are involved in only a handful of arguments, while a few are involved in the bulk of arguments. Figure 1 shows the percentages of unique arguments¹⁵ in which the top 25 most-frequently cited *Tannaim* are involved.¹⁶

200, compiles sources). However, Jeremy Tabick has questioned that assumption. See Tabick, "The Patriarch and the *Nasi*". We take no position on the merits of his argument, and our results do not depend on the identity of the Mishnah's redactor.

¹¹ Spaeth *et al.*, "2020 Supreme Court Database, Version 2020," code all United States Supreme Court decisions for various helpful parameters. Their database, like ours, allows scholars to make precise statements about general attitudinal trends among justices.

¹² Weinshall and Epstein, "Developing High-Quality Data Infrastructure for Legal Analytics," 316.

¹³ To be precise, we code which statements are ascribed to various *Tannaim* by the Mishnah. See Lapin, *Rabbis as Romans*, 45: "[T]he degree to which we can treat statements said in the name of a particular Rabbi as something like the words or opinions of that historical individual" is unclear.

¹⁴ As explained above, we are coding who Maimonides viewed as prevailing.

¹⁵ As we discuss in Appendix A, for most purposes, we treat a three-way argument as three separate two-way disputes. Here, though, we count it only once.

¹⁶ The Mishnah sometimes places an anonymous position somewhere other than first (so it is not technically the "*Tanna Kama*"), and we code this as "*Stam*".

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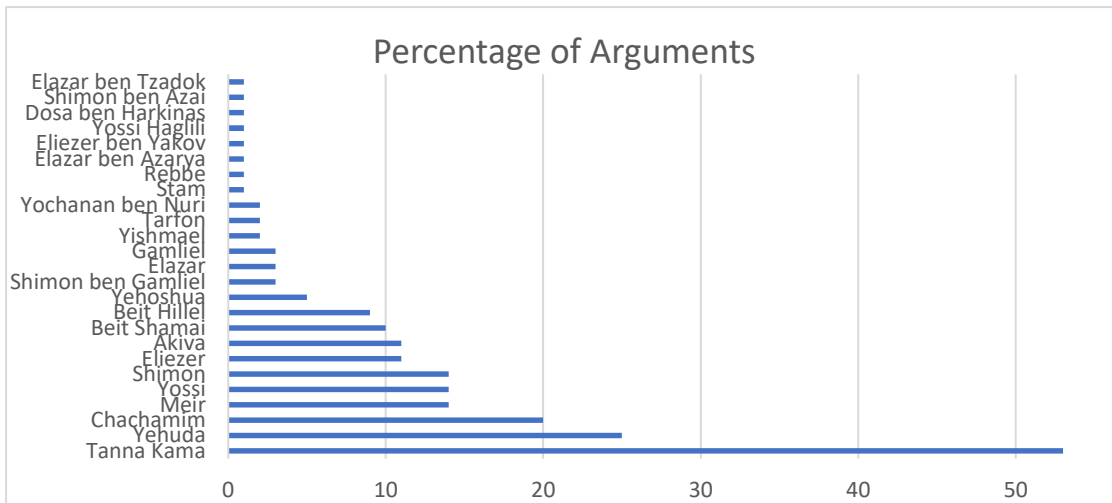


Figure 1: Percentage of arguments in which a *Tanna* is involved (Source: Authors' calculations)

<i>Tanna</i>	Total unique arguments (disputes ¹⁷)	Percentage of all arguments ¹⁸	<i>Tanna</i>	Total unique arguments (disputes)	Percentage of all arguments
1. <i>Tanna Kama</i>	1255 (1419)	53	14. <i>Gamliel</i>	64 (91)	2.7
2. <i>Yehuda</i>	603 (746)	25	15. <i>Yishmael</i>	56 (84)	2.4
3. <i>Hakhamim</i>	484 (556)	20	16. <i>Tarfon</i>	51 (68)	2.1
4. <i>Meir</i>	338 (434)	14	17. <i>Yohanan ben Nuri</i>	40 (53)	1.7
5. <i>Yossi</i>	335 (432)	14	18. <i>Stam</i>	34 (44)	1.4
6. <i>Shimon</i>	325 (431)	14	19. <i>Rabbi</i>	31 (34)	1.3
7. <i>Eliezer</i>	272 (367)	11	20. <i>Elazar ben Azariah</i>	28 (44)	1.2
8. <i>Akiva</i>	257 (370)	11	21. <i>Eliezer ben Yaakov</i>	27 (31)	1.1
9. <i>Beit Shammai</i>	235 (274)	9.9	22. <i>Yossi HaGelili</i>	24 (32)	1.0
10. <i>Beit Hillel</i>	226 (260)	9.5	23. <i>Dosa ben Harkinas</i>	19 (24)	0.8
11. <i>Yehoshua</i>	125 (169)	5.2	24. <i>Shimon ben Azzai</i>	17 (32)	0.7

¹⁷ In parenthesis, we include the number of disputes. See Appendix A.

¹⁸ Because some arguments involve more than two *Tannaim*, the sum of all the percentages adds up to slightly more than 200%.

<i>Tanna</i>	Total unique arguments (disputes ¹⁷)	Percentage of all arguments ¹⁸	<i>Tanna</i>	Total unique arguments (disputes)	Percentage of all arguments
12. <i>Shimon ben Gamliel</i>	77 (88)	3.2	25. <i>Elazar ben Zadok</i>	17 (29)	0.7
13. <i>Elazar</i>	71 (98)	3.0			

Table 1: Percentage of arguments in which a *Tanna* is involved (Source: Authors' calculations)

Figure 1 shows that, even among the top-25 *Tannaim* most commonly involved in a dispute, the top few are responsible for most arguments. As is well recognized, of the named disputants, the most prominent are four *Tannaim* from the Ushan period: Rabbis Meir, Shimon, Yehuda, and Yossi.¹⁹

However, the most important disputant is not actually a person; it is the construct of the *Tanna Kama*. This is to say, the Mishnah presents most arguments by first stating a law anonymously (the *Tanna Kama*), and then noting that some named *Tanna* disagrees. This is a key limitation of databases relying on text searches to find the names of the *Tannaim*:²⁰ more than half the time when the Mishnah presents an argument, it includes the *Tanna Kama* whose positions cannot be readily searched because they are unnamed.

Beyond that, the large majority of all mishnaic arguments involve only a dozen disputants. Of the named *Tannaim*—i.e., neither the *Tanna Kama* nor *Hakhamim*—the top four disputants are, from most frequent to least, Rabbi Yehuda,²¹ Rabbi Meir, Rabbi Yossi, and Rabbi Shimon. They are students of Rabbi Akiva (*Yevamot* 62b) who lived during the second century in Usha.²²

(1) *Who are the anonymous Tannaim?*

As Table 1 shows, two constructions are ubiquitous in the Mishnah: the *Tanna Kama* and the *Hakhamim*. To determine whose positions these constructs might represent, we look to the *Tannaim* with whom the *Tanna Kama* and the *Hakhamim* argue. Figure 2 depicts the arguments of the top 25 disputants. The width of the box around (or above) a *Tanna*'s name is proportional to the total number of unique arguments in which the *Tanna* is involved—both with other

¹⁹ E.g., Rosen-Zvi, *Mavo Lamishnah*, in *Sifrut Hazal HaeretZ-Yisraelit*, 21.

²⁰ Satlow and Sperling, “The Rabbinic Citation Network”; Zhitomirsky-Geffet and Prebor, “Sagebook,”; Kaplan, “Rabbinic Popularity in the Mishnah VII”.

²¹ In this way, too, Rabbi Yehuda is “the head of the speakers in every place” (*Bavli Shabbat* 33b).

²² Goldberg, “The Mishnah: A Study Book of *Halakha*,” 237-38.

members of the top 25 as well as with other *Tannaim*. The wider the box, the more often the *Tanna* is involved in an argument. The thickness and darkness of the lines connecting two *Tannaim* is proportional to the number of disputes²³ the two *Tannaim* have with one another. To give a sense of the largest-scale items, the *Tanna Kama* is involved in 1,255 arguments, and the line between Beit Shammai and Beit Hillel reflects 225 disputes. The y-axis portrays approximately when these *Tannaim* lived based on dates provided in the *Encyclopedia Judaica*. The three anonymous constructs—*Tanna Kama*, *Hakhamim*, and *Stam*²⁴, who potentially reflect tannaitic positions from different eras—are depicted in pink boxes. They are placed in the middle of the figure for convenience, but their placement is not intended to reflect anything about their period.

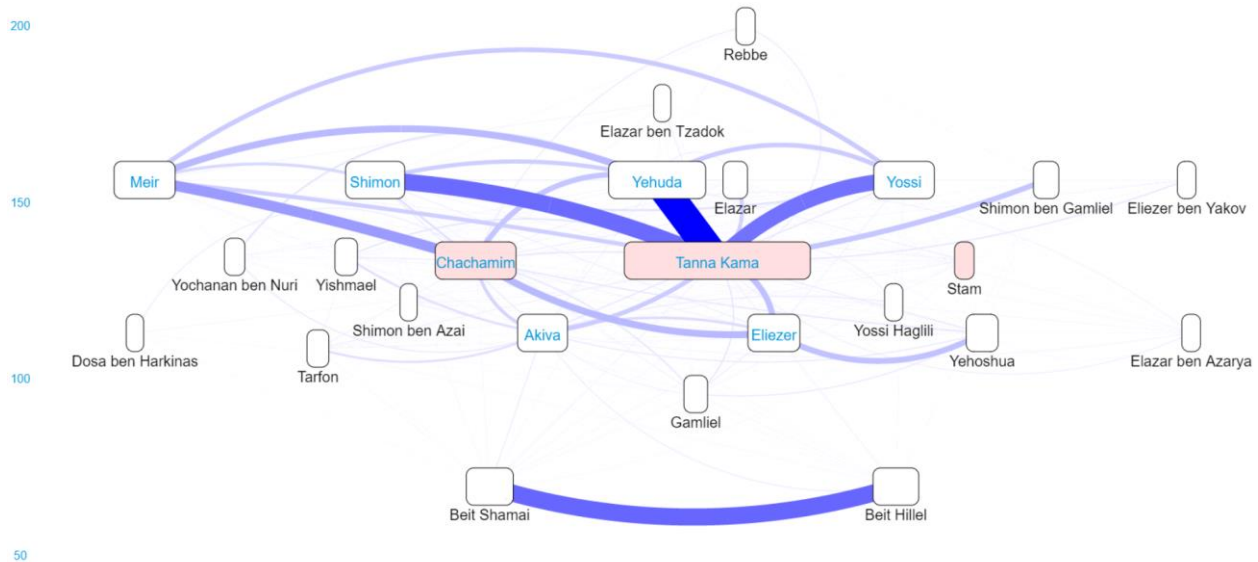


Figure 2: Frequency of disputes among *Tannaim* (Source: Authors’ calculations)

For purposes of identifying the anonymous *Tannaim*, Figure 2 shows three novel facts concerning the Ushan generation (the generation of Rabbi Meir). First, the Mishnah frequently presents the *Tanna Kama* as arguing with Rabbis Shimon, Yehuda, and Yossi but only rarely as arguing with Rabbi Meir—even though all four *Tannaim* appear frequently in the Mishnah. Second, and conversely, the *Hakhamim* frequently argue with Rabbi Meir but argue with Rabbis Shimon, Yehuda, and Yossi only rarely. We highlight these facts in Tables 2a and 2b

²³ Appendix A details how one multi-way “argument” can involve several two-way “disputes”.

²⁴ Defined above in n.16.

below: Table 2a shows the percentages of these four rabbis' arguments with the *Tanna Kama* and with the *Hakhamim*, and Table 2b shows the inverse: the percentages of the *Tanna Kama* and the *Hakhamim*'s arguments with these four named *Tannaim*. Third, of the arguments between named Ushan *Tannaim*, a disproportionate number involve Rabbi Meir. This is shown in Table 2c, which shows the percentages of arguments between the four most prominent named *Tannaim*. For example, Rabbi Meir and Rabbi Yehuda argue 90 times. This accounts for 27% of all of Rabbi Meir's arguments and 15% of Rabbi Yehuda's.

<i>Tanna</i>	Percentage of the <i>Tanna</i> 's arguments with the <i>Tanna Kama</i>	Percentage of the <i>Tanna</i> 's arguments with the <i>Hakhamim</i>
Meir	16%	41%
Shimon	67%	8%
Yehuda	65%	12%
Yossi	61%	3%

Table 2a: Percentage of *Tannaim*'s arguments with the *Tanna Kama* and the *Hakhamim* (Source: Authors' calculations)

<i>Tanna</i>	Percentage of the <i>Tanna Kama</i> 's arguments with the <i>Tanna</i>	Percentage of the <i>Hakhamim</i> 's arguments with the <i>Tanna</i>
Meir	4%	29%
Shimon	17%	6%
Yehuda	31%	15%
Yossi	16%	2%

Table 2b: Percentage of the *Tanna Kama* and *Hakhamim*'s arguments with the four most prominent *Tannaim* (Source: Authors' calculations)

<i>Tanna</i>	Meir	Shimon	Yehuda	Yossi
Meir	0%	12%	27%	18%
Shimon	12%	0%	17%	8%
Yehuda	15%	9%	0%	10%
Yossi	19%	8%	18%	0%

Table 2c: Percentage of the four most prominent named *Tannaim*'s arguments with one another (Source: Authors' calculations)

These three facts alone provide significant insight into the identities of the anonymous *Tannaim*. Let us first consider the *Tanna Kama*. Both the Talmud Bavli (*Sanhedrin* 86a citing Rabbi Yochanan) and Talmud Yerushalmi (*Yevamot*

4:11, 6b citing Rabbi Shimon ben Lakish²⁵) cite early Amoraim who believed that when a Mishnah states a view without attribution, such as when it uses the construct of the *Tanna Kama*, it is generally presenting Rabbi Meir's view. Our data supports this proposition. Of the four most prominent named *Tannaim*, Rabbi Meir is an outlier for how rarely he argues with the *Tanna Kama*. This makes sense if we accept the presumption set out in both Talmuds that the Mishnah (generally) uses the construct of the *Tanna Kama* to represent Rabbi Meir's position; Rabbi Meir would not be arguing with himself.

Possibly further supportive is the fact that, when various *Tannaim* are listed by name, Rabbi Meir is generally mentioned first—he is literally the *Tanna Kama* (the first *Tanna*). Table 3 tabulates the order in which the opinions of the major Ushan *Tannaim* are listed in their arguments with one another. As the table shows, Rabbi Meir's positions are generally presented first.²⁶

	Rabbi Meir later	Rabbi Shimon later	Rabbi Yehuda later	Rabbi Yossi later
Rabbi Meir 1 st		31	62	53
Rabbi Shimon 1 st	4		8	4
Rabbi Yehuda 1 st	25	21		27
Rabbi Yossi 1 st	3	10	7	

Table 3: Order of presentation of the arguments among the four most prominent named *Tannaim* (Source: Authors' calculations)

All this evidence points to the *Tanna Kama* reflecting the view of Rabbi Meir. To be sure, one could try to explain away each piece of evidence separately. In terms of which anonymous construct is presented as arguing with various *Tannaim*, one could speculate that, in presenting the views of Rabbis Shimon, Yehuda, and Yossi, the redactor of the Mishnah borrowed from an earlier source that generally used the construct of the *Hakhamim* and not the *Tanna Kama*, whereas the source that presented Rabbi Meir's view used the construct of the *Tanna Kama*. However, this is speculative, and it only explains one piece of evidence. Additionally, there is some evidence from sources contemporary to the Mishnah that the Mishnah's anonymous positions at least sometimes reflect the

²⁵ The Yerushalmi follows this with an interesting assertion by Rabbi Ze'eira: Rabbi Shimon ben Lakish discovered this principle empirically by noticing that unattributed positions are consistent with Rabbi Meir's view.

²⁶ Lieberman already noticed the trend that Rabbi Meir is generally presented before Rabbi Yehuda. Lieberman, *Tosefta Kifeshuta*, Beur Ha'aruch Zeraim vol. 1 p. 370.

views of Rabbi Meir (see Appendix C; Epstein, *Mevo 'ot le-Sifrut haTanna'im*, 96-106).

The *Hakhamim* present a more complicated question.²⁷ The *Hakhamim* argue a great deal with Rabbi Meir but not much with Rabbis Shimon, Yehuda, and Yossi. We see three possible explanations. The first is that the Mishnah is deliberately using the vehicle of the *Hakhamim* to represent a view that is arguing with Rabbi Meir. The second is that the redactor invoked *Hakhamim* when that was the majority view (consistent with “*Hakhamim*” meaning “Sages,” plural). The problem with this second approach is that it does not explain why Rabbi Meir is uniquely presented as the one arguing with *Hakhamim* so often. The third possibility (a slight modification of the second) is that the Mishnah uses the vehicle of the *Hakhamim* to present a view agreed on by Rabbis Shimon, Yehuda, and Yossi. However, if either the second or third explanation were correct, we would expect to see many instances where a position espoused by the Mishnah’s *Hakhamim* is identified in other tannaitic sources as belonging to multiple rabbis (and particularly two out of the three of Rabbis Shimon, Yehuda, and Yossi). We do not.²⁸ Finally, as discussed below in Section 2(b), the *Hakhamim* is quite inconsistent in its strictness attitude, which fits better with viewing the *Hakhamim* as a conglomeration of various viewpoints. Thus, we believe that the Mishnah intentionally uses the construct of the *Hakhamim* as a counterpoint to Rabbi Meir.

Unfortunately, there does not seem to be a better method for identifying anonymous positions in the Mishnah on a broad scale. We looked to contemporaneous sources to corroborate our conclusions with parallel sources that ascribe to a named *Tanna* a position that the Mishnah relays anonymously. This method provides insufficient information. As a case study, we reviewed the Tosefta on *Keilim* and *Ohalot*. As tabulated in Table 4, out of the hundreds of anonymous positions presented in the corresponding *Mishnayot* (and not just

²⁷ The Talmud Bavli does not have any general identification for the “*Hakhamim*” of the Mishnah. The Bavli assumes that the view of the “*Hakhamim*” in a particular Mishnah in *Horayot* (1:5) refers to Rabbi Shimon (*Horayot* 5b), but it identifies the “*Hakhamim*” in other *Mishnayot* as reflecting the views of other *Tannaim* (e.g., *Avodah Zarah* 7b; *Gittin* 46b).

²⁸ Instead, we see numerous cases where the Mishnah will identify multiple *Tannaim*, by name, espousing a single position against the view of a single *Tanna* (e.g., mBikurim 3:9-10; mPesachim 9:2; mParah 11:8 (in which Rabbi Yehuda, Yossi, and Shimon are all identified by name as agreeing on a position); we see *Hakhamim* presented as arguing with multiple *Tannaim* that jointly hold a position (e.g., mBrachot 1:5, mShabbat 3:8); and we see positions the Mishnah identifies as coming from *Hakhamim* being identified in the Tosefta as belonging to the *Tanna Kama* or an individual *Tanna* (e.g., mSheviit 5:5/tSheviit 4:4, mMaaser Sheni 1:2/tMaaser Sheni 1:4).

those involving disputes),²⁹ only a handful represent positions ascribed explicitly by the Tosefta to either Rabbi Meir or Rabbi Yossi (see Appendix C).

Meir	Yossi	Not Meir	Not Yossi	Unclear
6	4	5	11	3

Table 4: Number of anonymous positions in *Mishnayot Keilim* and *Ohalot* that can be identified as belonging to or contradicting Rabbi Meir or Rabbi Yossi based on corresponding Tosefta (Source: Authors’ calculations)

This is very little data—particularly by comparison with the 119 instances where the *Tanna Kama* is involved in arguments in Mishnah *Keilim* and *Ohalot*—and, as Table 4 shows, even this data is not uniform. Moreover, looking to the de-anonymized arguments in the Tosefta is methodologically problematic. It seems likely that at least portions of the Tosefta functioned as a gloss on, and therefore a reaction to, some form of our Mishnah.³⁰ The Tosefta’s choice to name a position that the Mishnah presented anonymously might be done intentionally: for example, the Tosefta may have chosen to name a position that the Mishnah presented anonymously precisely because the Mishnah was not using the anonymous constructs in the standard form. As a result, looking to parallel *Toseftot* creates selection bias that renders statistical analysis difficult or impossible. Therefore, a careful comparison with the Tosefta can only modestly supplement our more systematic analysis.

* * * * *

The use of anonymous constructs and the differentiation between Rabbi Meir and his colleagues raise three “why?” questions. (a) Why did the redactor of the Mishnah use anonymous constructs at all? (b) Why did the redactor use two different anonymous constructs (i.e., the *Tanna Kama* and the *Hakhamim*)? (c) Why are there exceptions to these rules?

a. Why did the redactor use anonymous constructs?

The most likely reason that the redactor used anonymous constructs is that he wanted to promote specific views. Consider the first Mishnah in Sukkah: “A Sukkah that is more than twenty cubits high is unfit. Rabbi Yehuda deems it fit.” In this presentation, the first position (the *Tanna Kama*) is presented as the normative view with which a lone *Tanna*, Rabbi Yehuda, argues. The reader is left to assume that the law follows the first position. Or, conversely, consider the Mishnah later in that same chapter: “One who establishes his Sukkah like a type

²⁹ The reason those two tractates and *Tannaim* are chosen is explained in Section 3(a) below.
³⁰ Hauptman, *Rereading the Mishnah*, 14-16 summarizes literature suggesting this view, although she nuances this point.

of hut ... Rabbi Eliezer deems it unfit because it does not have a roof, and the Sages deem it fit" (mSukkah 1:11). The lone Rabbi Eliezer is presented as arguing with the "Sages". Here, the reader would assume that the law follows the second opinion because it is presented as the view of the Sages. (In fact, the Mishnah (*Eduyot* 5:7) acknowledges the general rule that one should follow the Sages.) Whether presented through the *Tanna Kama* or through the *Hakhamim*, the anonymous position is presented as the norm, giving the position more gravitas. Indeed, the Talmud Bavli already suggests that the Mishnah presents an anonymous opinion specifically to promote it (e.g., *Bavli Beitzah* 2b). This would explain why the Mishnah presents only 18 arguments³¹ between the *Tanna Kama* and the *Hakhamim*; the redactor of the Mishnah would not want to promote two contrasting views. If the redactor's goal were to promote the anonymous positions, then he was largely successful. Our data shows that Jewish practice (as codified by Maimonides) follows the *Tanna Kama* and the *Hakhamim* in the overwhelming majority disputes (82%, and 90%, respectively); and Jewish practice goes against Rabbis Meir, Shimon, Yehuda, and Yossi in most cases in which they are explicitly identified (79%, 74%, 72%, and 56%, respectively).

b. Why did the redactor use two different anonymous constructs?

We see two possible explanations for why the redactor used a different anonymous construct for Rabbi Meir than for his colleagues. The first (and we believe more likely) reason is that Rabbi Meir was the bannerman of tradition. By this we mean that Rabbi Meir was the redactor of an "earlier layer" of the Mishnah that the redactor of our Mishnah used as a base text.³² Presumably, Rabbi Meir set out his own views anonymously and, largely, without dispute. Our Mishnah's redactor then edited that earlier text by later appending the positions of Rabbi Meir's contemporaries who argued with Rabbi Meir.

³¹ Even this may be overstating the case because 11 of the 18 arguments between the *Tanna Kama* and the *Hakhamim* involve an additional named position, so it is possible the *Hakhamim* are arguing only with the named position and are just explaining the *Tanna Kama*. Also, in one of the remaining seven cases (*Shabbat* 21:3), there are questions whether the text of the Mishnah invokes the *Hakhamim* (Talmud Bavli *Shabbat* 143a Bach). However, for purposes of counting, we stick with the rule of relying on Maimonides's interpretation.

³² Various scholars have posited that our Mishnah is fundamentally a modification of an earlier compilation. Goldberg, "The Mishnah: A Study Book of *Halakha*," 214, 223; Brody *Mishna and Tosefta Studies*, 122 (arguing that, at least in some instances, there was an early "central tannaitic text" that was then the subject of "incremental and protracted" redaction); Epstein, *Mevo 'ot le-Sifrut haTanna'im*, 204 ("the Mishnah that [the redactor] Rebbe compiled was fundamentally the Mishnah that was compiled before him, and Rebbe himself was satisfied with, at times, giving its explanation and reasoning") Albeck, *Mavo Li'Mishna*, 100 (the redactor "retained as a basis for his compilation the Mishnah of Rabbi Meir"). See also, Frankel, *Darkhei HaMishnah*, 212.

Further support for the fact that the earlier layer presented Rabbi Meir's view comes from arguments where the Tannaim are named. Table 2c, above, shows that the Mishnah recounts a disproportionately large number of arguments between Rabbi Meir on the one hand, and one of his three colleagues on the other, as compared with arguments among his three colleagues. This is consistent with the assumption that the redactor started with a text that presented Rabbi Meir's view and then merely appended other views on top. Arguments that do not involve Rabbi Meir just would not come up that frequently. That is also why, as Table 3 shows, Rabbi Meir comes first even when everyone is named³³; the redactor started with Rabbi Meir's text. If we are correct, the Mishnah's use of *Hakhamim* to present a position contrary to that of Rabbi Meir shows an active intervention by the redactor of our Mishnah on top of an earlier layer.

The natural next question is why the redactor of our Mishnah was inconsistent: (a) sometimes he leaves Rabbi Meir as the anonymous position (the *Tanna Kama*) and then appends that Rabbi A argues; (b) sometimes he changes the anonymous Mishnah to expressly name Rabbi Meir and then presents the opposing view through the construct of the *Hakhamim*; and (c) sometimes he expressly names both positions. The redactor of the Mishnah, we posit, chose between the first two options based on whether he agreed or disagreed with Rabbi Meir's position. If he thought Rabbi Meir was right, he would keep Rabbi Meir's position anonymous, because, as the *Bavli* (*Beitzah* 2b) recognizes, this gives Rabbi Meir's position the normativity of the law. If the redactor of our Mishnah thought Rabbi Meir was wrong, he named Rabbi Meir explicitly and then added the opposing view with the imprimatur of the "*Hakhamim*". We do not have a theory about why the redactor sometimes (albeit less frequently than either of the first two options) deanonymized both positions.

Up to this point, we have assumed that the default is that the choice to present Rabbi Meir through the construct of the *Tanna Kama* reflects the primacy of his role in transmitting the Jewish tradition. For completeness's sake, though, we mention another radically different possibility: the refusal to associate Rabbi Meir with the honorific *Hakhamim* was a deliberate choice that reflected Rabbi Meir's status as an outsider. This would be consistent with the *Bavli*'s statement

³³ Perhaps this is also what is happening in arguments between Beit Shammai and Beit Hillel. The Talmud *Bavli* already noticed that in arguments between Beit Shammai and Beit Hillel, Beit Shammai is cited first in the Mishnah (*Bavli Eruvin* 13b). If, as scholars have suggested, Beit Shammai's views reflected a more traditional approach than Beit Hillel's (Noam, "*Beit Shammai Va-Ha-Halakhah Ha-Kitatit*," 49 summarizes the relevant literature), then it would make sense that Beit Hillel's views, which were modifying the standard assumption would be appended onto Beit Shammai's. To be sure, the Talmud itself offers a different interpretation: that Beit Hillel were modest and that is why they presented Beit Shammai's views first.

that when tannaitic works³⁴ refer to “*Acherim*”—literally, “others”—they are referring to Rabbi Meir (*Bavli Horayot* 13b-14a).³⁵ It would also be consistent with the Yerushalmi’s story of an attempt to excommunicate Rabbi Meir (*Yerushalmi Moed Katan* 3:1, 81c). And this would further be consistent with the fact that the Talmud Bavli recounts how Rabbi Yochanan defended Rabbi Meir’s connection to Rabbi Akiva (*Bavli Sanhedrin* 14a) suggesting that there were people in the early Amoraic era who sought to divorce Rabbi Meir from the standard line of tradition.³⁶ It does not, however, explain why Rabbi Meir is so frequently listed first (both explicitly and through the *Tanna Kama*).

c. *What to make of the exceptions?*

It is important to recognize that there are many exceptions to the rules we set out above. While Rabbi Meir argues with the *Tanna Kama* far less frequently than his three colleagues, it remains true that the *Tanna Kama* and Rabbi Meir argue 55 times³⁷ (accounting for 16% of all of Rabbi Meir’s disputes). In these cases, presumably, the *Tanna Kama* reflects the views of some other *Tanna*—not Rabbi Meir.³⁸ And, in fact, the Talmud Bavli recognized that some anonymous *Mishnayot* present opinions of people other than Rabbi Meir (e.g., *Bavli Yoma* 42b, *Hullin* 85a).

Also, while the *Hakhamim* are far more likely to argue with Rabbi Meir than with his three colleagues, this rule is not absolute; Rabbi Yehuda, in particular, has a significant number of disputes with the *Hakhamim* (72 arguments accounting for about 12% of all of Rabbi Yehuda’s arguments). In addition, there are a few *Mishnayot* that initially present a view as coming from the *Tanna Kama* and then later refer to the same view as coming from the *Hakhamim*³⁹—so in those instances the two are used interchangeably.

³⁴ The Mishnah never uses this expression.

³⁵ Although Goldblatt, “The Story of the Plot against R. Simeon B. Gamaliel II” argues that portions of the Talmudic story in *Horayot*—involving Rabbi Meir’s attempt to depose the patriarch—were invented later, he, too, proposes that some *Amoraim* saw the anonymization of Rabbi Meir’s positions as an attempt to derogate Rabbi Meir. An elegant analysis of the development of the *Horayot* text is found in Rubenstein, *Talmudic Stories*, 176-211, and Baumgarten, *Rabbi Judah I and his Opponents*, 156-61.

³⁶ Rabbi Meir appears to have studied under the tutelage of several teachers including Rabbi Yishmael (Talmud Bavli *Eruvin* 13a; *Yerushalmi Sotah* 2:4, 18a), as well as the heretic Elisha ben Avuya (Talmud *Bavli Hagigah* 15a; *Ruth Rabbah* 6:4).

³⁷ This occurs mostly in *Seder Zeraim*.

³⁸ The other option is that, occasionally, there are different traditions about what Rabbi Meir said. This would be akin to how some explain situations where Rabbi Meir disagrees with *Acherim* (see *Sotah* 12a *Tosafot s.v. Acherim*). However, there are certainly examples (and some examples are provided below in Appendix C) where the *Tanna Kama* of the Mishnah is identifiable as some *Tanna* other than Rabbi Meir based on other tannaitic sources.

³⁹ E.g., *Bava Metzia* 4:3; *Bava Batra* 5:9; *Keilim* 12:4-5; *Niddah* 2:3; also, compare *Sanhedrin* 7:1 with 9:3.

There are a few possible reasons why the Mishnah has exceptions to the trends we have identified. Probably the most significant one is that the editing of the Mishnah was too complex a process to be completely uniform and homogeneous. As we discuss in greater detail in Section 2(a) below, there are whole tractates that seem to have been redacted in a different manner than the rest of the Mishnah, and it seems likely that small portions of other tractates may also have been edited by someone other than the standard redactor. There are also practical reasons why there would be exceptions to how the *Tanna Kama* and the *Hakhamim* are used. By definition, the construct of the *Tanna Kama* can be used to present a position only if the redactor is willing to put that position first. Also, as a practical matter, the Mishnah presents the *Hakhamim* only *after* identifying a contrary view. These facts, themselves, might dictate the usage of the *Tanna Kama* or the *Hakhamim*. Say, for instance, Rabbi Meir and Rabbi Yehuda argue, and the redactor of the Mishnah finds it more natural to present Rabbi Yehuda's position first.⁴⁰ Then, whichever way the redactor wants the law to come out, he would be in a bind. If he wanted to rule like Rabbi Meir, then he cannot present Rabbi Meir through the construct of the *Tanna Kama* because he wants to present Rabbi Yehuda's position first. And if the redactor wanted to rule like Rabbi Yehuda, then he could not use the more normal vehicle of the "*Hakhamim*" because the Mishnah does not present the *Hakhamim* as the first position. In these cases, the redactor might use the *Tanna Kama* for Rabbi Yehuda or it might use the *Hakhamim* for Rabbi Meir (or it might not use either construct and just name both positions).

* * * * *

To further investigate the identity of the *Tanna Kama* and the *Hakhamim*, we consider the attitudes of these *Tannaim*. We largely focus on strictness/leniency because the Mishnah itself recognizes this as a meaningful way to analyze some *Tannaim*'s positions (*Mishnah Eduyot* 4:1) and because it is a binary variable that can be applied to many mishnaic arguments.⁴¹ Again, we first present a broad illustration of all the top-25 *Tannaim* (Figure 3) and then focus on the six major *Tannaim* (Table 5).

Figure 3 is visually like Figure 2, but here the width of a box corresponds to the number of arguments in which a *Tanna* participates that relate to strictness, with the lines connecting *Tannaim* asymmetrical. The thickness of the line as it connects to a box reflects the number of disputes where that *Tanna* took a strict position when arguing with the other *Tanna* with whom the line connects. Thus,

⁴⁰ Goldberg "The Mishnah: A Study Book of *Halakha*," 223-225 gives some reasons why this might be.

⁴¹ In addition to the many arguments for which strictness is not a relevant metric, there are a small number of disagreements where different people might see one or the other position as stricter (see: Klapper, "Is freeing an *Agunah* a leniency or a stringency?"). We leave those uncoded.

for example, the fact that the line connecting Beit Shammai and Beit Hillel is much thicker on Beit Shammai's side reflects the fact that Beit Shammai is generally stricter than Beit Hillel in their arguments.⁴² To give a sense of the largest-scale items, the *Tanna Kama* is involved in 998 unique arguments that can be categorized as having a strict position, and, as between Beit Shammai and Beit Hillel, Beit Shammai is strict in 152 disputes and Beit Hillel is strict in 66 disputes.

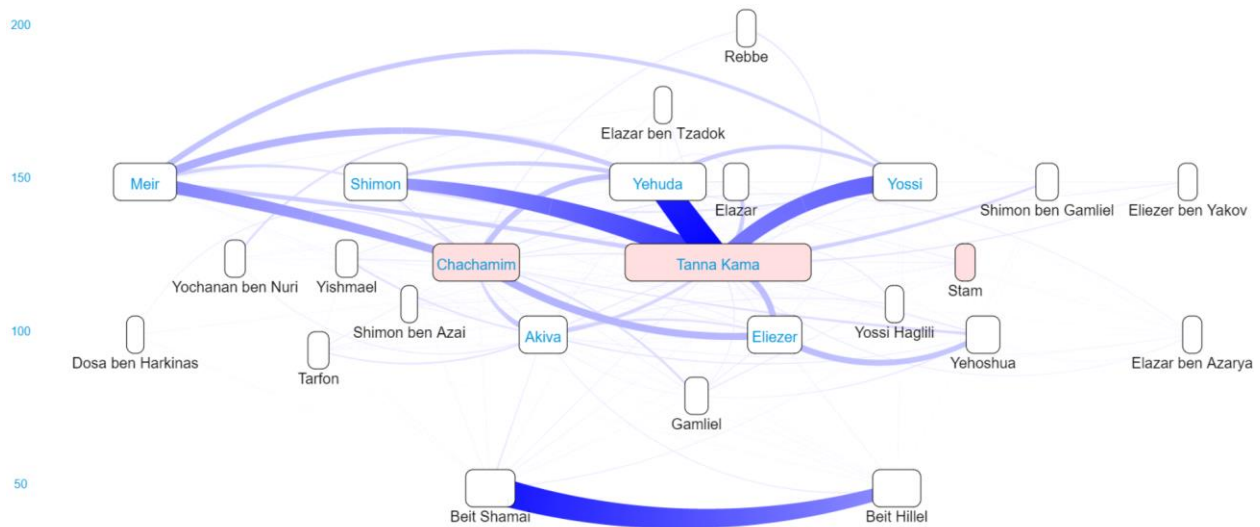


Figure 3: Comparative strictness based on tannaitic disputes (Source: Authors' calculations)

Table 5 focuses on the six most common disputants and provides the percentage of arguments in which the *Tanna* is strict, requires charity, and requires civil payment. Because so many arguments relate to strictness, that data is more robust.

⁴² It is interesting to note that strictness seems to be a very strong demarcation for Beit Shammai/Hillel, but it becomes less drastic in later generations. This could be because of hindsight bias—people recognized Beit Shammai as strict and therefore, they would sometimes amend an argument between Beit Shammai and Beit Hillel to make Beit Shammai stricter. In other words, the perceived bias changed the tradition. For example, *Bavli Shabbat* 143a suggests flipping the text of a Mishnah precisely because Beit Hillel appears to be strict. But it is also possible that Beit Shammai and Beit Hillel may have seen strictness/leniency as a lens for reading the law whereas later *Tannaim* used other lenses for looking at the law.

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<i>Tanna</i>	Arguments that can be coded for strictness (disputes)	Arguments that can be coded for charity (disputes)	Arguments that can be coded for civil payments (disputes)	Strict positions	Positions requiring charity	Positions requiring civil payments
<i>Tanna Kama</i>	998 (1130)	90 (98)	57 (61)	55%	53%	51%
Rabbi Meir	280 (367)	24 (27)	19 (22)	62%	57%	45%
<i>Hakhamim</i>	418 (486)	33 (34)	15 (18)	44%	38%	44%
Rabbi Yehuda	475 (604)	43 (50)	32 (35)	46%	60%	34%
Rabbi Shimon	280 (366)	19 (23)	9 (13)	32%	41%	65%
Rabbi Yossi	285 (364)	25 (34)	11 (12)	47%	26%	58%

Table 5: Selected attitudes and win rates of the major *Tannaim* (Source: Authors' calculations)⁴³

The standard errors for the strictness of these six *Tannaim* are shown in Figure 4 below.

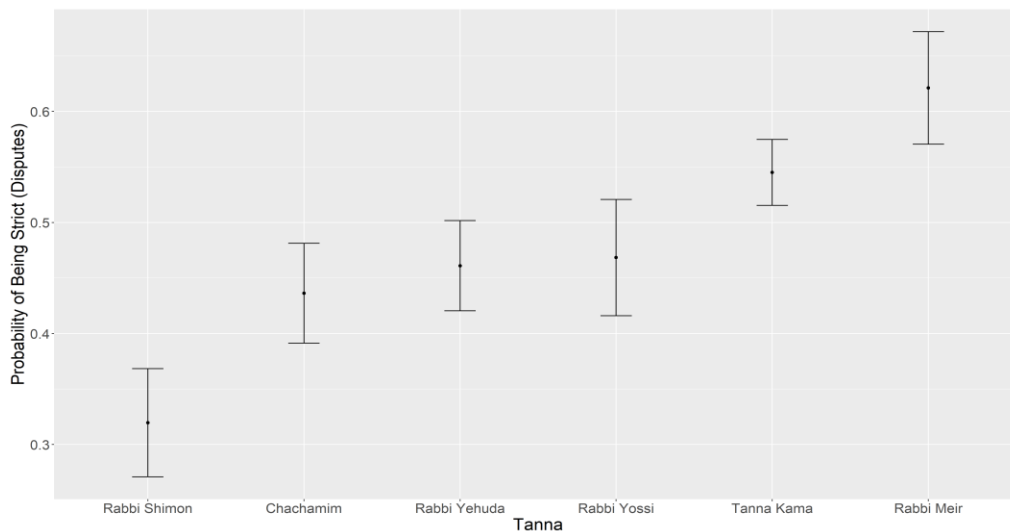


Figure 4: Standard error bars for strictness (Source: Authors' calculations)

Figure 4 shows that Rabbi Meir is significantly stricter than the *Tanna Kama*. Assuming the Mishnah is using the construct of the *Tanna Kama* to present Rabbi Meir's views, the difference in attitude suggests a deliberate choice by the redactor of the Mishnah to present only certain of Rabbi Meir's positions through the construct of the *Tanna Kama*. Perhaps the redactor of the Mishnah was more

⁴³ Similar data for the top-25 disputants is shown in Appendix B.

lenient than Rabbi Meir generally, so he disproportionately presented Rabbi Meir's lenient positions as the *Tanna Kama*.

(2) *How was the Mishnah compiled?*

Beyond just helping identify the anonymous constructs, looking at the Mishnah holistically offers insight into how the Mishnah may have been compiled (although, of course, the anonymous constructs are an important piece of the puzzle). In this section, we consider the Mishnah's consistency. The basic insight is that the more consistency there is in the Mishnah, the more likely it is that the Mishnah was compiled in a uniform fashion: it could be that one person compiled the whole Mishnah as Rav Sherira Gaon posits (*Iggeret Rav Sherira Gaon* 21), or it could be that, as some scholars have proposed,⁴⁴ one person compiled an early layer of the Mishnah, and then another person took that and amended all of it.

Broadly speaking, we find significant consistency regarding who is arguing and their strictness/leniency across the whole Mishnah, but this consistency is largely driven by the Mishnah's presentation of the Ushan *Tannaim*.

a. Our Mishnah

To analyze the consistency within the Mishnah, we compare the six *sedarim* of Mishnah.⁴⁵ Table 6 shows the number of arguments per chapter⁴⁶ in the different *sedarim*.⁴⁷

Seder	<i>All Mishnah</i>	<i>Zerai m</i>	<i>Moed</i>	<i>Nashim</i>	<i>Nezikin</i>	<i>Kadoshim</i>	<i>Taharot</i>
<i>Arguments</i>	2,381	383	403	304	371	319	680
<i>Average number of arguments per chapter</i>	4.55	5.18	4.58	4.28	5.08	3.51	5.40

⁴⁴ See above note 32.

⁴⁵ According to the Talmud Bavli, the existence of our six *sedarim* goes back at least as far as Resh Lakish (*Bavli Shabbat* 31a). The notion of some form of six *sedarim* goes back to Rabbi Chiya (*Bavli Bava Metzia* 82b). Kahana, "*Tapuhei Zahav Bimishkhiyot Kesef*," has a nice presentation of early discussions of the *sedarim*.

⁴⁶ Here, we removed arguments that are duplicated within the same Seder but included arguments duplicated only in a different Seder.

⁴⁷ The reason we do not look at the numbers per separate *Mishnayot* is that the division of *Mishnayot* has changed over the centuries whereas the division of chapters has remained consistent (see Rosen-Zvi, *Bein Mishnah LiMidrash*, 26).

Table 6: Number of Arguments in the Sedarim (Source: Authors' calculations)⁴⁸

As Table 6 shows, the average number of arguments per chapter is 4.55 (bookended by *Kadoshim* on the lower side and *Taharot* on the higher side).⁴⁹

Table 7 shows the relative percentages of a *Tanna's* arguments within a *seder* as compared with all the arguments found in the *seder* (the "All Mishnah" column provides these same numbers but for the whole Mishnah).

<i>Tanna</i>	<i>All Mishnah</i>	<i>Zeraim</i>	<i>Moed</i>	<i>Nashim</i>	<i>Nezikin</i>	<i>Kadoshim</i>	<i>Taharot</i>
<i>Tanna Kama</i>	53	53	49	55	47	56	51
<i>Yehuda</i>	25	23	32	20	24	24	24
<i>Hakhamim</i>	20	19	18	15	26	22	23
<i>Meir</i>	14	13	11	13	14	15	16
<i>Yossi</i>	14	14	13	11	8	12	19
<i>Shimon</i>	14	13	9	10	10	22	15
<i>Eliezer</i>	11	16	11	13	8	11	10
<i>Akiva</i>	11	11	9	10	11	12	11
<i>Beit Shammai</i> ⁵⁰	10	14	15	12	12	2	10

⁴⁸ The reason the sum of the number of arguments in the six *sedarim* is greater than the number of arguments in all of Mishnah because there are *Mishnayot* that are duplicated across multiple *sedarim*.

⁴⁹ *Kadoshim* has eight chapters with no arguments (mZevakhim 5; mMeilah 2; mTamid 1, 2, 4, 6; mMidot 5; mKinim 1), which is one more than all the other five *sedarim* combined. There are many reasons this might be. Perhaps, *Kadoshim*, which concerns the law of temple sacrifices, has fewer arguments because, with the temple destroyed, there were fewer newly arising questions. Perhaps, because *Kadoshim* involves questions of communal observance, there was more uniform practice. Or, perhaps, some *Tannaim* did not address temple practice because it was not within their jurisdiction. See Naftali Cohn, *The Memory of the Temple and the Making of the Rabbis*, 88: "When the Temple still existed, it is doubtful that a non-priestly and non-aristocratic group like the rabbis could have had any important role in the Temple"; only "when the Temple was gone [could] the rabbis...lay claim to it". At the same time, the number of arguments in *Taharot* (along with the fact that, at 126 chapters, it is by far the largest *seder*) suggests that the subject of *Taharot*, ritual purity, was still alive and well at the time—as scholars have surmised (see Adler, *Hashmirah al Hilchot Tahara*). By the time the Talmud was compiled, this appears to no longer have been the case: Apart from tractate *Niddah*, there is neither Talmud Bavli nor Talmud Yerushalmi on *Seder Taharot*. Sussmann, "Babylonian *Sugiyot* to the Orders *Zera'im* and *Tohorot*," 9-13, 17, argues that these *sedarim* were studied in the land of Israel but not in Babylonia at the time.

⁵⁰ Neusner, *An Introduction to Judaism*, 163, claims broadly that early *Tannaim* "deal specifically" with laws of marriage, sexual relations, and the laws of cleanliness. Beit

<i>Tanna</i>	<i>All Mishnah</i>	<i>Zeraim</i>	<i>Moed</i>	<i>Nashim</i>	<i>Nezikin</i>	<i>Kadoshim</i>	<i>Taharot</i>
<i>Beit Hillel</i> ⁵⁰	9	13	14	12	11	2	10
<i>Yehoshua</i>	5	7	3	5	5	3	7
<i>Shimon ben Gamliel</i>	3	2	2	6	8	2	1
<i>Elazar</i>	3	1	1	6	1	5	4
<i>Gamliel</i>	3	3	5	5	4	1	2

Table 7: Percentage of *seder*'s arguments among major *Tannaim* (Source: Authors' calculations)

This table shows that *Tannaim* who are frequently cited in one *seder* are, for the most part, frequently cited in other *sedarim*. Epstein has noted that these *Tannaim* are generally from the school of Rabbi Akiva (This contrasts with what Epstein shows in some *Midrashei Halakhah* in which a significantly larger number of students of Rabbi Yishmael are cited.⁵¹) This, at the very least, suggests that the Mishnah reflects a single school.

More interesting is the consistency in the usage of the two anonymous constructs: the *Tanna Kama* hovers at around 50% across all *sedarim*, and the *Hakhamim* are near 20%. It is unlikely that different redactors would use these constructs in similar fashions: some redactors might never present an anonymous position, some might use the construct of the *Tanna Kama* throughout, some might use the *Hakhamim* throughout, and some might have their own unique method of choosing whether to ascribe something to the *Tanna Kama* or to the *Hakhamim*. Indeed, as we show below, there is no similar consistency in how these constructs are used in presenting Yavnean *Tannaim*.

The inter-*seder* consistency is further confirmed by looking at the strictness attitudes of the *Tannaim*, which is shown in Table 8.

<i>Tanna</i>	<i>All Mishnah</i>	<i>Zeraim</i>	<i>Moed</i>	<i>Nashim</i>	<i>Neziki n</i>	<i>Kadoshi m</i>	<i>Taharot</i>	σ ⁵²
<i>Tanna Kama</i>	0.55	0.51	0.62	0.59	0.68	0.46	0.52	0.08
<i>Yehuda</i>	0.46	0.45	0.45	0.52	0.38	0.62	0.41	0.09
<i>Hakhamim</i>	0.44	0.50	0.53	0.38	0.41	0.42	0.39	0.06

Shammai and Beit Hillel are part of these early *Tannaim*, yet, as Table 7 shows, they argue nearly everywhere—in five of six *sedarim*. Furstenberg, “Rabbis as Jurists in the Roman East” (forthcoming), notes that, except for *Eduyot*, *Seder Nezikin* has a low percentage of citations of the early *Tannaim*, but that still leaves at least four *sedarim* with numerous arguments between Beit Shammai and Beit Hillel.

⁵¹ Epstein *Mevo'ot le-Sifrut haTanna'im*, 520.

⁵² σ refers to the standard deviation across the six *sedarim*.

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<i>Tanna</i>	<i>All Mishnah</i>	<i>Zeraim</i>	<i>Moed</i>	<i>Nashim</i>	<i>Neziki n</i>	<i>Kadoshim</i>	<i>Taharot</i>	σ^{52}
<i>Meir</i>	0.62	0.56	0.54	0.71	0.63	0.72	0.61	0.07
<i>Yossi</i>	0.47	0.61	0.42	0.50	0.44	0.43	0.44	0.07
<i>Shimon</i>	0.32	0.35	0.19	0.22	0.48	0.29	0.32	0.10
<i>Eliezer</i> ⁵³	0.50	0.50	0.49	0.35	0.35	0.65	0.56	0.12
<i>Akiva</i>	0.58	0.45	0.58	0.70	0.55	0.57	0.62	0.08
<i>Beit Shammai</i>	0.74	0.60	0.84	0.71	0.26	0.38	0.85	0.24
<i>Beit Hillel</i>	0.26	0.35	0.17	0.38	0.62	0.50	0.21	0.17
<i>Yehoshua</i>	0.50	0.40	0.60	0.60	0.60	0.32	0.55	0.12
<i>Shimon ben Gamliel</i>	0.40	0.60	0.57	0.12	0.38	0.33	0.38	0.17
<i>Elazar</i>	0.49	0.50	0.75	0.65	0.67	0.38	0.38	0.16
<i>Gamliel</i>	0.41	0.47	0.32	0.15	0.70	0.60	0.56	0.20

Table 8: Strictness attitudes of major *Tannaim* in each *sefer* (Source: Authors' calculations)

Table 8 shows that the attitudes of the more-frequent disputants are relatively consistent across the various *sedarim*.

(As an interesting aside, we note that there are two *Tannaim* who are generally strict and two who are generally lenient. The two that are strict are Beit Shammai, which is well known,⁵⁴ and Rabbi Meir, which is not. The two *Tannaim* that are generally lenient are Beit Hillel, which is similarly known, and Rabbi Shimon, which, again, is not.⁵⁵ Although not our issue, this is an important insight for those, like Abraham Goldberg,⁵⁶ who try to identify differences in the approaches of the various students of Rabbi Akiva: our data shows that Rabbi Meir is generally strict and Rabbi Shimon is generally lenient.)

At bottom, there is significant consistency in who is cited and the strictness attitudes of those cited. To be clear, our data suggests only that the Mishnah was *generally* compiled in a uniform fashion. That does not preclude the possibility

⁵³ That Rabbi Eliezer is so much more lenient than Beit Shammai offers some support to Guttman's theory that Rabbi Eliezer should not be identified as a student of Beit Shammai. See Guttman "The Problem of the Anonymous Mishna," 121-122. To be sure, there are strong arguments for identifying Rabbi Eliezer with Beit Shammai, E.g., Leibson, "*Al mah Minadin*" at 303 n.53.

⁵⁴ *Eduyot* 4:1.

⁵⁵ In a private conversation in 2021, Furstenberg noted that the Talmud Bavli tells two stories where Rabbi Yehoshua ben Levi declares that "Rabbi Shimon is worthy of being relied on in exigent circumstances" (*Bavli Brachot* 9a; *Gittin* 19a), which, perhaps, suggests that the Bavli recognized Rabbi Shimon as being generally lenient.

⁵⁶ Goldberg "The Mishnah: A Study Book of *Halakha*," 218.

that portions were compiled by other redactors. Particularly notable are the two tractates that have disproportionately few arguments: *Tamid* (in which 4 of 7 chapters have no arguments) and *Avot* (in which 2 of 5 have none). The rest of Mishnah has only 9 chapters with no arguments.⁵⁷ Moreover, *Tamid* and *Avot* are different in other ways. Louis Ginzberg shows *Tamid* is stylistically different from other tractates, and he further notes that the three arguments that are included in *Tamid* were likely added after the Mishnah was codified.⁵⁸ Epstein notes that *Avot* is unusual as it cites multiple later *Tannaim* (and even early Amoraim) who are not mentioned elsewhere in the Mishnah.⁵⁹

There is also reason to believe that certain individual *Mishnayot* were compiled separately. The Talmud already recognizes that the *Mishnayot* in the beginning of *Bava Kama* are stylistically different from the rest of the Mishnah, suggesting they were authored by someone else (*Bavli Bava Kama* 6b). There are also *Mishnayot*, for instance those at the end of *Sotah*, that appear to reflect the views of unusually late *Tannaim*.⁶⁰ Additionally, there is not absolute uniformity between the various *sedarim*. Rabbi Shimon appears significantly more frequently in *Seder Kadoshim* than in the other five *sedarim*.⁶¹ And in both *Seder Zeraim* and *Seder Moed*, Rabbi Meir argues with the Tana Kama about as frequently as he does with the *Hakhamim*. While that is still a lower percentage of arguments with the Tana Kama than his colleagues, it is still unusually high for him.⁶²

That said, it is important not to lose sight of the forest for the trees: overall, there is significant inter-*seder* consistency. In the next section we break this down by period.

⁵⁷ *Ma'aser Sheni* 1, *Yevamot* 9, *Shavuot* 8, *Zevachim* 5, *Me'ilah* 2, *Middot* 5, *Kinnim* 1, *Nigaim* 3, *Nigaim* 9. Most of these chapters include no cited authorities at all (see Ginzburg 40).

⁵⁸ Ginzberg, "*Tamid*: The Oldest Treatise of the Mishnah."

⁵⁹ Epstein, *Mevo'ot le-Sifrut haTanna'im*, 232. Rosen-Zvi, "The Wisdom Tradition in Rabbinic Literature and Mishnah *Avot*," 187-188 cites some of the literature on *Avot*.

⁶⁰ Epstein, *Mevo'ot le-Sifrut haTanna'im*, 227-29, and Albeck, *Untersuchungen uber die Redaktion der Mischna*, 126-38, both analyze late *Mishnayot*.

⁶¹ Maybe Rabbi Shimon was more interested in *Kadoshim* than other *sedarim*. This would be like what we assume happens with Rabbi Shimon ben Gamliel who is relatively overrepresented in the two *sedarim* that deal with civil law because that was presumably his provenance as the community leader.

⁶² Perhaps other factors, such as those set out in Goldberg, "The Mishnah: A Study Book of *Halakha*," 223-225, make it frequently more convenient to list Rabbi Meir second in *Zeraim* and *Moed* than in other *sedarim* and that, in turn, requires a different construct than the *Tanna Kama*.

b. Comparing Ushan Tannaim with earlier Tannaim

Previously, we described the Mishnah’s tendencies in how it uses anonymous constructs when presenting the views of the Ushan generation—the generation of Rabbis Meir, Shimon, Yehuda, and Yossi. Generally, the *Tanna Kama* argues with Rabbis Shimon, Yehuda, and Yossi, whereas the *Hakhamim* argue with Rabbi Meir. It is interesting that there is no parallel tendency for how the Mishnah uses anonymous constructs in presenting views of earlier generations. This is graphically shown in Figures 5 and 6⁶³—where we show, respectively, arguments among the Ushan generation and arguments among the pre-Ushan generations, and where we divide the anonymous constructs based on the generations of *Tannaim* with whom they argue.

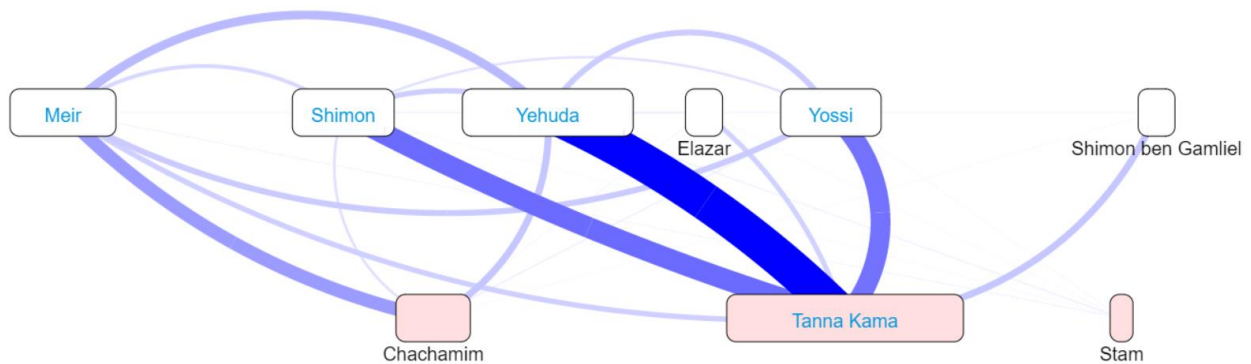


Figure 5: Frequency of disputes among Ushan *Tannaim* (Source: Authors’ calculations)

⁶³ Because we are focusing on a particular time period, for these figures the thickness of the boxes is proportional to the disputes a particular *Tanna* has with other members of the Ushan generation.

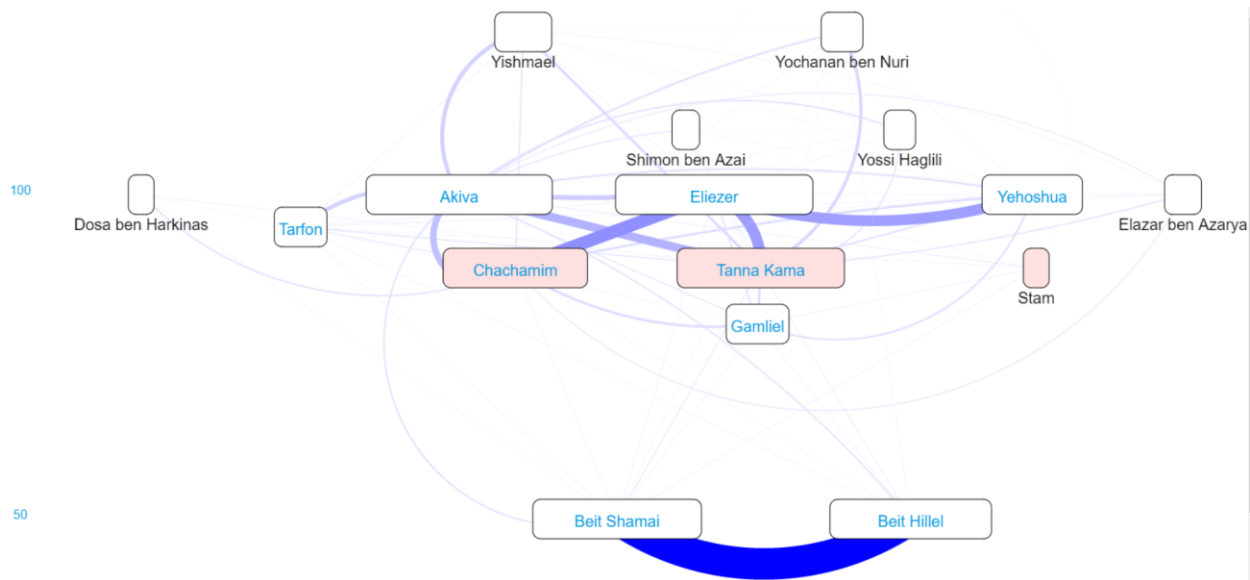


Figure 6: Frequency of disputes among pre-Ushan *Tannaim* (Source: Authors' calculations)

As Figure 6 shows, for pre-Ushan *Tannaim* the anonymous constructs are used mainly to present disagreement with positions of Rabbis Akiva and Eliezer, but there is no clear pattern for how each anonymous construct is used. For both Rabbi Akiva and Rabbi Eliezer, the Mishnah is as likely to use the *Tanna Kama* as *Hakhamim*.

In terms of consistency of the strictness/leniency attitudes of the constructs, the data in Table 9 shows a relatively high degree of consistency for the way the Mishnah uses the *Tanna Kama* to present arguments with Ushan *Tannaim* (what we call the Ushan *Tanna Kama*) as compared with how it uses the other anonymous constructs.

Unlocking Ancient Texts with New Tools

Strictness	<i>Zeraim</i>	<i>Moed</i>	<i>Nashim</i>	<i>Nezikin</i>	<i>Kadoshim</i>	<i>Taharot</i>	σ
Ushan <i>Tanna Kama</i> ⁶⁴	0.52	0.61	0.58	0.71	0.52	0.56	0.07
Yavnean <i>Tanna Kama</i> ⁶⁵	0.45	0.68	0.58	0.67	0.45	0.34	0.14
Ushan <i>Hakhamim</i>	0.47	0.62	0.24	0.17	0.43	0.51	0.17
Yavnean <i>Hakhamim</i>	0.56	0.57	0.55	0.35	0.27	0.30	0.14

**Table 9: Strictness attitudes of anonymous constructs across two periods
(Source: Authors' calculations)**

The consistency and deliberateness in the Mishnah's presentation of the Ushan *Tanna Kama* as compared to the Yavnean *Tanna Kama* is instructive for how the Mishnah was redacted. First, that the Mishnah has a consistent approach for using anonymous constructs in its arguments with Ushan *Tannaim* but not Yavnean *Tannaim* suggests that the Mishnah we have includes multiple layers that were separately compiled, as scholars have suggested.⁶⁶ Our data suggests that there was a (relatively) strong editorial hand in the redactor's compilation of the Ushan *Tannaim*, as reflected by the consistency in the choice of anonymous constructs (e.g., Rabbi Meir argues with the *Tanna Kama* and Rabbi Yossi argues with the *Hakhamim*). The consistency in the *Tanna Kama*'s attitude—as compared with the compilation of the pre-Ushan *Tannaim* (by, perhaps, Rabbi Meir)—also suggests strong editorial intervention.⁶⁷ But our data suggests a lighter editorial hand in the compilation of the pre-Ushan stratum. Thus, Albeck's supposition that the redactor of the Mishnah “combined in his tractates the *Mishnayot* collected in the various schools without having made any changes or additions to

⁶⁴ “Ushan *Tanna Kama*” and “Ushan *Hakhamim*” refer to these constructs in their arguments with Rabbis Elazar, Meir, Shimon, Shimon ben Gamliel, Yehuda, and Yossi.

⁶⁵ “Yavnean *Tanna Kama*” and “Yavnean *Hakhamim*” refer to these constructs in their arguments with Rabbis Akiva, Elazar ben Azariah, Eliezer, Gamliel, Tarfon, and Yehoshua.

⁶⁶ Epstein, *Mevo 'ot le-Sifrut haTanna'im*, 21-233; Goldberg, “The Mishnah: A Study Book of *Halakha*,” 214; Goldberg, *Ohalot*, Critical edition, at 11; Henshke, *Mishnah Rishonah B'Talmudam Shel Tannaim Achronim*; Henshke, “*Al Rovdei Haggadat HaPesach BaMishnah*,” 35-41; Henshke, “*Simcha Hee Lo*,” notes 2-5.

⁶⁷ Guttman, “The Problem of the Anonymous Mishna,” 144 already proposed that “the concept of *Setam*,” meaning unattributed positions (whether as part of a dispute or not), “seems to have undergone a process of change from the time of R. Akiba onwards.”

them”⁶⁸ seems to be a good description for how the pre-Ushan sources were compiled. It is, however, inaccurate for how the redactor dealt with the final, Ushan, stratum.⁶⁹

(3) *Testing various propositions*

Our new dataset can be used to test many other propositions. In the hopes that others will consult our database, we present a few applications.

a. Epstein 1957

Epstein makes many claims about the Mishnah as whole; we consider three. First, Epstein claims that Rabbi Yossi is a “moderator” (i.e., taking an intermediate position between two extremes).⁷⁰ In the Mishnah, there are 48 multiway arguments that involve Rabbi Yossi and in which we could discern a middle position. Of those, Rabbi Yossi takes the middle position in 20 (41%), which is only slightly better than a random result. Describing Rabbi Yossi as a moderator is thus overstating the facts—at least for Mishnah.⁷¹

Second, Epstein understands the Talmud Bavli (*Eruvin* 79a) as identifying the *Tanna Kama* in *Ohalot* as Rabbi Yossi. (Tosafot *ad loc* understand the Talmud’s statement differently;⁷² Goldberg presents other reasons to doubt attributing *Ohalot* to Rabbi Yossi.⁷³) While we recognize the risks of small sample sizes, our data casts doubt on Epstein’s identifications. In *Ohalot*, 11 of the 16 arguments in which Rabbi Yossi is involved are with the *Tanna Kama*—which is in fact higher than Rabbi Yossi’s normal percentage. Rabbi Meir, meanwhile,

⁶⁸ Albeck, *Untersuchungen über die Redaktion der Mischna*, 37. See Albeck, *Mavo LaMishnah*, 102: “[T]he redactor never changed the *Mishnayot* from the way he received them.” Elman, “Order, Sequence, and Selection,” presents a nice synopsis of the literature on this subject.

⁶⁹ Albeck’s proof is that the Mishnah sometimes contains essentially duplicate *Mishnayot* in somewhat different forms. The problem with extrapolating from this phenomenon is twofold. *First*, Albeck focuses exclusively on duplicate *Mishnayot*, which themselves suggest a redactoral oversight—why duplicate the same law in two places? *Second*, Albeck focuses only on the differences between duplicate *Mishnayot*. But the fact some *Mishnayot* are duplicated exactly would point to more care in the redactoral process. At bottom, the existence of different forms of the same Mishnah suggests that some *Mishnayot* were incorporated with little change, but one cannot simply extrapolate from that to how the whole Mishnah was redacted.

⁷⁰ Epstein, *Mevo ’ot le-Sifrut haTanna ’im*, 126 (“*Machria*”).

⁷¹ See Goldberg, “*Vi’Khulhu Alibba DeRabbi Akiva*,” 241 and Goldberg, “The Mishnah: A Study Book of *Halakha*,” 218 for a less-ambitious claim: That Rabbi Yossi is the moderator for arguments involving Rabbi Meir and Rabbi Yehuda. That holds up better (10 out of 14 times).

⁷² Milikowsky, *Seder Olam: Critical Edition* 135 n.44 discusses this in greater length.

⁷³ Goldberg, *Ohalot*, critical ed. at 11-15.

has 16 arguments in *Ohalot*, and only 2 are with the *Tanna Kama*. Thus, it is unlikely that the *Tanna Kama* in *Ohalot* is Rabbi Yossi.

A careful analysis of the Tosefta lends credence to this view. In Appendix C, we compare positions the Mishnah reports without attribution (e.g., through the construct of the *Tanna Kama* or without dispute) with parallel statements made and attributed in the Tosefta to either Rabbi Meir or Rabbi Yossi. Only two anonymous *Mishnayot* reflect Rabbi Yossi's view, one reflects Rabbi Meir's view, four others reflect a view opposed to Rabbi Yossi's, and one reflects a view opposed to Rabbi Meir's. We thus have identified more anonymous *Mishnayot* in *Ohalot* that contradict the identification of the Tanna Kama as Rabbi Yossi than ones that support the claim.

Third, Epstein asserts that *Keilim* was compiled by Rabbi Yossi. Rabbi Yossi is involved in 30 arguments in *Keilim*, and in more than half (17) argues with the *Tanna Kama*. Rabbi Meir, meanwhile, argues with the *Tanna Kama* in only four of his 36 arguments. Thus, *Keilim* appears to be like other tractates where unattributed positions (as opposed to, *inter alia*, positions presented through the *Hakhamim*) are generally Rabbi Meir's. Our analysis of parallels between named positions in *Tosefta Keilim* and anonymous positions in the Mishnah further supports this conclusion. As shown in Appendix C, the Tosefta shows two anonymous *Mishnayot* that reflect Rabbi Yossi's view, five that reflect Rabbi Meir's, seven that reflect a view that opposes Rabbi Yossi, and four that reflect a view that opposes Rabbi Meir.

Epstein derives his position that unattributed statements in *Keilim* reflect Rabbi Yossi's view from the last Mishnah in *Keilim*: "Rabbi Yossi said: Happy are you *Keilim*, for you began with uncleanness, but you ended with cleanness." Respectfully, this situation highlights the danger of using a single statement to prove a broad point. Rabbi Yossi's statement suggests that he had some kind of organized discussion of the laws of *Keilim* that opened with impurity and concluded with purity, and that Rabbi Yossi used this to present an elegant conclusion to this very long tractate. Our Mishnah, too, utilizes this organizational principle—perhaps precisely so that it can conclude with Rabbi Yossi's statement. However, the fact that both texts use a similar organizational principle does not mean that our tractate *Keilim* was Rabbi Yossi's. As Rabbi Shimon MiKinon notes, *Tosefta Keilim* uses a similar organizational structure even as it differs significantly from our Mishnah in many other aspects (*Sefer Krihut, Limudim* 2:58). What's more, that the last Mishnah mentions Rabbi Yossi by name suggests that Rabbi Yossi's positions are not the default.

b. Gray 2019

Gray⁷⁴ asserts that tannaitic literature views charity as analogous to dedicating items to God and thus akin to other acts of religious observance. (She contrasts this with Babylonian amoraic literature, which, she argues, is more ambivalent on the issue.⁷⁵) Our data supports her understanding of the tannaitic approach.⁷⁶ As Appendix B shows, there is a strong positive correlation ($\rho = 0.61$, significant at the 1% level) between *Tannaim* who are strict in non-charity questions and those who are strict in charity questions. This is consistent with *Tannaim* seeing charity as one commandment among many, so that their attitudes towards religious observance permeate their analysis of charity as well. Appendix B also shows that there is no statistically significant correlation between *Tannaim* who require civil payments and *Tannaim* who require charitable payments. Although both involve forcing someone to give up money, the *Tannaim* apparently see the two as fundamentally different. That a *Tanna* generally requires civil payments does not mean that the same *Tanna* is likely to require charity.

c. Rosen-Zvi 2020

Rosen-Zvi states that Beit Shammai and Beit Hillel argue more frequently in the beginnings of tractates.⁷⁷ True. 57 of Beit Shammai's arguments with Beit Hillel occur in the first chapter of a tractate. No other chapter even comes close.

Rosen-Zvi also claims that it is rare for the Mishnah to present an argument between a *Tanna* of one generation and a *Tanna* of another, and Rosen-Zvi specifically calls out the Mishnah's use of Rabbi Akiva as an example of this rule.⁷⁸ Our data shows that, while Rosen-Zvi's general rule is true, Rabbi Akiva is actually a counterexample. As Figure 2 shows, Rabbi Akiva is unique in regularly arguing with both earlier and later generations; other *Tannaim* generally stick to arguing with their contemporaries.

Conclusion

The 2,381 mishnaic arguments cover an astounding range of religious and legal disagreements. The *Tannaim* were themselves concerned by the quantity of arguments. The Tosefta states that the number of arguments reflects a lack of careful study (t*Sotah* 14:1). Barry Wimpfheimer goes so far as to suggest that the Mishnah sees "law-as-dispute", meaning "that law's ideal state is permanent

⁷⁴ Gray, *Charity in Rabbinic Judaism*, 35-39, 52.

⁷⁵ *Ibid.* at 39-53.

⁷⁶ We have not tested her statements about *Amoraim*.

⁷⁷ Rosen-Zvi, *Bein Mishnah LaMidrash*, 52.

⁷⁸ Rosen-Zvi, *Bein Mishnah LaMidrash*, 53-54.

dispute”.⁷⁹ Yet, despite the central role that arguments play in the Mishnah, no one has comprehensively analyzed the phenomenon of mishnaic arguments. Rather, only piecemeal studies of arguments between specific pairs of *Tannaim* exist, and often those studies focus on a pair of *Tannaim* only with respect to a specific issue.⁸⁰ Our scholarship aims to fill this gap. We manually coded all arguments in the Mishnah, and this article presents a comprehensive analysis across the whole corpus of the Mishnah—following in the recent trend of considering the Mishnah as a holistic work⁸¹—that advances recent scholarship applying digital humanities techniques to early Rabbinic literature.⁸² Our manual coding avoids two major flaws that come from using automated tools to classify texts. First, most arguments in the Mishnah present one position without attribution (the *Tanna Kama*), and automated searches will miss this most-central player. Second, automated searches can tell us only who is arguing, but they cannot tell us anything about the types of positions being taken. Our manual analysis of the entire corpus of Mishnah allows us to examine the positions the *Tannaim* are taking.

Our quantitative analysis has allowed us to test various propositions. (1) We have shown that it is likely that the redactor of our Mishnah started with a compendium of Rabbi Meir’s and then appended other views to it. (2) Our data also suggests a relatively heavy-handed redactor for the Ushan layer of our Mishnah. (3) Our data allows us to test various theories about *Tannaim*: It challenges Epstein’s identification of the redactor of certain tractates; it confirms Alyssa Gray’s insight that the *Tannaim* view charity as just another commandment; and it supports Rosen-Zvi’s assertions about Beit Shammai and Beit Hillel frequently appearing early in a tractate but nuances his position that intergenerational arguments are rare. To be clear, though, while we see quantitative data as an important tool for analyzing texts, it is of course only one tool. Careful close readings are irreplaceable not least of all because in many instances there might not be enough data to work with.

We hope that the data we have already collected will be helpful to others.⁸³ We have also begun an analysis of attitudes of the *Tannaim* in the Tosefta. In

⁷⁹ Wimpfheimer, “Conflict over the Essential Nature of Law,” 379-380, 388, 391, 394. As an elegant proof text, he points to mHagigah 2:2, where there is dispute that continues for four generations. In the fifth generation, Hillel and Menachem suddenly agree, but Menachem is then replaced by Shammai who disagrees, “and the dispute rolls merrily along.” *Ibid.* at 379.

⁸⁰ See *supra* note 3.

⁸¹ Rosen-Zvi, “Orality, Narrative, Rhetoric,” 235.

⁸² Satlow and Sperling, “The Rabbinic Citation Network”; Starr, *Classifying the Aramaic Texts from Qumran*; Zhitomirsky-Geffet and Prebor, “Sagebook.”

⁸³ We recognize that there are likely some errors. As Maimonides writes in the postscript to his commentary on the Mishnah, we ask that if anyone finds an error in our data, they let us know by relaying it to Daniel Kazhdan at kazhdan.daniel@gmail.com.

terms of the Tosefta, we are interested in studying: the slightly different cast of characters in the Tosefta, seeing whether *Tannaim* mentioned in both the Mishnah and the Tosefta maintain consistent attitudes across the two; whether the anonymous *Tannaim* in the Tosefta represent a different view (Talmud Bavli *Sanhedrin* 86a); and whether we can use this to analyze the relationship between Mishnah and Tosefta.⁸⁴ In so doing, we hope to supplement and test the existing scholarship that compares various tannaitic compendia.⁸⁵

⁸⁴ Hauptman, *Rereading the Mishnah*; Friedman, *Tosefta Atiqta*.

⁸⁵ E.g., Kahana, *Sifre Zuta Devarim*, 42-68; Fraade, “The Torah of the King”; Bar-Asher Siegal, “The Unintentional Killer”.

Appendix A: Detailed methodology

Choice of text and interpretation: It is rare that different interpretations in the Mishnah will affect the very basic variables that we study. Nonetheless, it happens. To minimize the subjectivity inherent in creating databases out of texts (Fluh *et al*, *Toward Undogmatic Reading*, 20), we always relied on Maimonides's commentary to the Mishnah based on the translation of Joseph Kapach because Maimonides's commentary is essentially the first comprehensive commentary on the whole Mishnah and because it has become a standard reference for understanding Mishnah.⁸⁶ To be sure, Maimonides' interpretations are sometimes disputed, but some choice has to be made in how to interpret ambiguous Mishnayot. Correspondingly, we relied on the text of the Mishnah included in Kapach's edition of the Mishnah. However, the choice of text makes little difference for our purposes.⁸⁷ When comparing every tenth chapter in Kapach's edition of Mishnah against the same chapter in the Kaufman manuscript, we find an average of about one relevant difference—i.e., a change in name⁸⁸ (which is, at most, one of two *Tannaim* involved in a single argument) or a change in the attitude expressed (e.g., strict versus lenient)—per 8.7 chapters.⁸⁹ To determine which *Tanna* wins a dispute (which, we recognize, necessarily requires overlaying a later authority onto the Mishnah), we follow the ruling of Maimonides in his code, the *Mishneh Torah*, where available. If Maimonides did not choose a prevailing position in the *Mishneh Torah*, we rely on his rulings in his commentary to the Mishnah (Kapach). If neither Maimonidean source chooses a prevailing position, we leave the dispute unresolved. Using those sources, we analyze the entire Mishnah and code every argument based on the criteria discussed above: the names of the *Tannaim* who are arguing; their approaches to questions of strictness, social-welfare obligations, and civil arguments; and who wins.

Strictness/leniency: A few words on how we determine strictness may be helpful. In most cases, the choice of leniency/strictness is self-evident. A *Tanna* that penalizes someone for an action is strict relative to a *Tanna* that does not.

⁸⁶ Faleck, "The Revival of Mishnah Study in the Early Modern Period," 8.

⁸⁷ Of course, for many other questions, the choice of text can be far more significant (Brody, *Mishna and Tosefta Studies*, 11-31; Brody, *Mishna and Tosefta Ketubbot Text, Exegesis and Redaction*, 1-48, and, for those kinds of questions, it may be preferable to use the Kaufman manuscript (Lapin, *Early Rabbinic Civil Law*, 243).

⁸⁸ The most common change was Elazar versus Eliezer. See Epstein, *Mavo le-Nusah haMishnah*, 1162.

⁸⁹ The one notable exception is *Bikkurim* chapter 4, which is absent from Kapach but is printed in the Kaufman edition. However, it has long been understood that that chapter does not properly belong in the Mishnah (see Lieberman, *Tosefta Kifeshuta*, Beir Ha'aruch Zeraim vol. 2 pp. 836-837). Regardless, it is *sui generis* and therefore statistically insignificant for these purposes. (Neither Kapach nor Kaufman include what is commonly printed as chapter 6 of *Avot*, but that is certainly not Mishnaic.)

Likewise, a *Tanna* that limits the ways one can accomplish a desired goal is stricter than one who makes this easier. Consider the first Mishnah in *Zeraim*: The Mishnah presents a few opinions on when one can say the *Shema* prayer. Rabbi Eliezer's ruling that allows one the least amount of time for the prayer is the strictest (*Brachot* 1:1). Likewise, in a different context, that certain ownerless animals are put to death according to the *Tanna Kama* is strict in comparison to Rabbi Yehuda who allows them to live (*Bava Kama* 4:7).

Some cases, though, are more nuanced, and the same rationale can lead to both a stringency and a leniency. See e.g. *mChallah* 4:4-5. There, as the Mishnah recognizes, the rationale leading Rabbi Akiva to be strict in the first case he discusses (Mishnah 4) "turns into a leniency" in the second case he discusses (Mishnah 5). For our coding purposes, since the Mishnah presents two arguments—one in which Rabbi Akiva is lenient and one in which *Hakhamim* are lenient—we code them as two separate arguments. Had the Mishnah presented only one of the two examples, we would have used that to determine who was lenient and who was strict (notwithstanding the fact that the underlying rationale leads to both leniency and strictness). The Mishnah's choice in how it presents the argument itself determines whether the position is a leniency or a stringency. Thus, our data reflects how the Mishnah presents the underlying *Tannaim* but may, sometimes, not reflect the attitudes of the *Tannaim* themselves.

Multi-position arguments: Although most arguments in the Mishnah (87%) present only two positions, there are cases with three or more positions, and in those cases, we treat one "argument" as multiple two-way "disputes". Consider, for example, a three-way argument between Rabbi Gamliel, Rabbi Yehoshua, and Rabbi Akiva (e.g., *Brachot* 4:3). To fit the triangular peg of a three-way argument into the round hole of two-way disputes, we treated these as three separate two-way disputes: one between Rabbi Gamliel and Rabbi Yehoshua, one between Rabbi Gamliel and Rabbi Akiva, and one between Rabbi Yehoshua and Rabbi Akiva. (There are two six-way arguments in the Mishnah [*Ma'aser Sheni* 2:9; *Mikva'ot* 2:10], and, under our system, we code them as fifteen separate two-way disputes.⁹⁰)

Relatedly, sometimes the Mishnah will present an argument with two separate *Tannaim* espousing the same position (this happens fairly frequently in *Eduyot*). So, for example, *Eduyot* 6:2 states that Rabbi Yehoshua and Rabbi Nehunya ben Elinathan (or Elnathan, as per MS Kaufmann) both believe that a limb that is separated from a corpse is impure whereas Rabbi Eliezer believes it to be pure. As before, we treat these as two separate disputes: one between Rabbi Yehoshua

⁹⁰ When there are 'n' disputants and we are making pairs, there are $n! / (2! (n-2)!) = (n * (n-1)) / 2$ unique pairs. For n = 3 this is 3. For n = 6 this is 15.

and Rabbi Eliezer and the other between Rabbi Nehunya ben Elinathan and Rabbi Eliezer (with Rabbi Eliezer losing both).

Undisputed named positions: Some *Mishnayot* expressly name one *Tanna* without presenting an express disagreement, and, in those cases, it can be unclear whether there is an argument. Consider *Zavim* 4:4. The Mishnah is discussing a *Zav*—a person with a certain type of abnormal bodily discharge who is impure. It declares that a *Zav* who lies across six chairs, with his two hands on two chairs, two feet on two other chairs, his head on one, and his body on the other, renders impure only the chair on which his body is resting. The Mishnah continues, “If he stood on two seats: Rabbi Shimon says if they were apart from one another, they are pure.” Maimonides appears to understand Rabbi Shimon’s statement as disputed, but Ra’avad⁹¹ assumes it is not (*Mishneh Torah, Tumat Mishkav U’Moshav* 7:4). Although we flag these scenarios in the database as including an “implicit opinion”, we do not include such opinions in our calculations because there are cases where a named statement is undisputed in the Mishnah (*Tosafot Yom Tov Bikkurim* 3:6 cites numerous instances). Determining whether there is a contrary implicit opinion in any given case is too subjective.

Duplicate Mishnayot: A small number of arguments (3.5%) are duplicated in the Mishnah.⁹² We include these arguments only once. However, if two *Mishnayot* report arguments that are not identical but appear to be only similar or interrelated, we include both because, ultimately, there is too much line-drawing in deciding when two arguments are related enough that they should be counted only once.

Namefellows: Inconveniently, several prominent *Tannaim* share a name: there are (a) two Rabbi Shimon ben Gamliels,⁹³ (b) two Rabbi Gamliels, (c) at least two Rabbi Eliezer ben Yakovs, and (d) two Rabbi Elazar ben Tzadoks. Fortunately, none of these *Tannaim* are among the top-10 most represented disputants in the Mishnah, so we take comfort in the fact that even if we have erred in their identification, our results will not change dramatically. That said, scholars have generally assumed that any citation of Rabbi Gamliel and Rabbi Shimon ben Gamliel is to the later of the two *Tannaim* who share the name.⁹⁴ For Rabbi Gamliel, our data supports this assumption because, when the Mishnah names his disputants, Rabbi Gamliel is generally arguing with contemporaries of

⁹¹ Ra’avad is an abbreviation for Rabbi Abraham ben David, a twelfth century scholar who wrote a critical gloss on Maimonides.

⁹² Cohen, *Shemen HaMishnah*, Appendix 3. This occurs commonly in *Eduyot* but rarely elsewhere.

⁹³ The Mishnah refers to them as *Rabban* Gamliel and *Rabban* Shimon ben Gamliel. For convenience and consistency with other *Tannaim*, though, we will refer to them with the more common honorific of “Rabbi.”

⁹⁴ *Niddah* 6b, *Tosafot* s.v. *Bi’Shifhato*; Hyman, *Toldot Tannaim Va’Amoraim* vol. 3 pp.1162-71.

Gamliel II (particularly Rabbis Yehoshua, Eliezer, and Akiva). Rabbi Eliezer ben Yakov presents a more complicated question, but, fortunately, he is an even less frequent disputant,⁹⁵ so any mistake in dating some of his arguments is relatively insignificant. Admittedly arbitrarily, we date him as the later Rabbi Eliezer ben Yakov simply so we can include him in the chart. Rabbi Elazar ben Tzadok is a still less-frequent disputant. Most of his arguments with named *Tannaim* are with Ushan *Tannaim*, so we dated him accordingly.

Data Availability: The data is available at GitHub for download by interested researchers at <https://github.com/BenjaminKay/MishnaBase>. In addition, we provide some convenient and hopefully simple-to-use data tools for interacting with the data to answer questions about the data without specialized software. For starting users, we provide examples like:

1. Finding all disputes involving Rabbi Meir;
2. Finding all disputes between Rabbi Meir and Rabbi Eliezer;
3. Finding all disputes in *Keilim*;
4. Finding all disputes in *Zeraim*;
5. Finding all disputes between Beit Hillel and Beit Shammai involving strictness;
6. Finding all disputes between Beit Hillel and Beit Shammai involving strictness where Beit Hillel is stricter;
7. Summary statistics of disputes by *seder*; and
8. Breakdown of disputes with *Hakhamim*.

However, these are only a starting point. The underlying software (Datasette) allows users to answer numerous questions about the contents of the data. Users can also download the data and explore it with other software if they so choose.

The coding of the various arguments was spot-checked by various volunteers and paid assistants. Ultimately, a sample of 91 chapters (out of the 524 chapters in Mishnah) were independently checked for errors. On average, there was one miscoded name per, approximately, seven chapters, and a miscoded attitude (e.g., strict/lenient) or winner per five chapters. This analysis and the published data reflect these corrections. Any remaining mistakes are our own.

⁹⁵ Rashi already noticed that Rabbi Eliezer ben Yakov is rarely mentioned in the Mishnah (*Yevamot* 49b *s.v. Amar*).

Appendix B: Attitudes and win rates of the major *Tannaim* (Source: Authors' calculations)

<i>Disputant</i>	Total Args.	Strict Args.	Charity Args.	Civil Args.	% Strict	% Strict non-charity	% Charity	% Civil payment
<i>Tanna Kama</i>	1255	998	90	57	55	55	53	51
<i>Yehuda</i>	603	475	43	32	46	48	60	34
<i>Hakhamim</i>	484	418	33	15	44	43	38	44
<i>Meir</i>	338	280	24	19	62	65	57	45
<i>Yossi</i>	335	285	25	11	47	44	26	58
<i>Shimon</i>	325	280	19	9	32	31	41	65
<i>Eliezer</i>	272	229	27	7	50	52	65	55
<i>Akiva</i>	257	193	30	9	58	59	42	67
<i>Beit Shammai</i>	235	201	16	3	74	78	70	100
<i>Beit Hillel</i>	226	193	15	3	26	23	31	12
<i>Yehoshua</i>	125	109	12	2	50	51	41	0
<i>Shimon ben Gamliel</i>	77	44	3	6	40	34	0	67
<i>Elazar</i>	71	60	2	2	49	47	0	100
<i>Gamliel</i>	64	49	5	4	41	40	50	100
<i>Yishmael</i>	56	41	4	1	55	63	72	100
<i>Tarfon</i>	51	36	12	8	35	47	69	56
<i>Yochanan ben Nuri</i>	40	33	2	1	42	41	50	0
<i>Stam</i>	34	30	1	0	49	49	0	NA
<i>Rebbe</i>	31	24	1	3	54	54	50	0
<i>Elazar ben Azariah</i>	28	25	2	2	38	32	20	62
<i>Eliezer ben Yakov</i>	27	24	0	0	41	41	NA	NA
<i>Yossi HaGili</i>	24	20	4	1	52	61	71	0
<i>Dosa ben Harkinas</i>	19	14	1	1	25	20	0	100
<i>Elazar ben Tzadok</i>	17	16	2	0	41	39	50	NA
<i>Shimon ben Azai</i>	17	10	0	0	83	83	NA	NA

Appendix C: Comparison of Tosefta to anonymous statements in *Keilim* and *Ohalot*

We believe these are the relevant examples where *Tosefta Keilim* and *Ohalot* can be used to identify an anonymous position in *Mishnayot Keilim* and *Ohalot* as either representing or contradicting a position of Rabbi Meir or Rabbi Yossi. For those interested in analyzing the sources, Rabbi Samson of Sens's commentary on the Mishnah generally cites the relevant parallel *Toseftot* and Rabbi David Pardo's commentary on the Tosefta (the *Chasdei David*) generally cites the relevant parallel *Mishnayot*.

Keilim:

Meir/Yossi (comments)	Tosefta	Mishnah
Not Yossi	ר' יוסי אומר זובו של זב ורוקו ושכבת זרעו ומימי רגליו ורביעית מן המת למה אמרו רביעית לפי שכל עובר תחלת ברייתו יש בו רביעית דם ודם הנדה כיוצא במרכב חומר בהן שאין במרכב ובמרכב שאין בהן שהן שוה מגען למשאן לטמא אדם ולטמא בגדים מה שאין כן במרכב חומר במרכב שהמרכב מטמא תחת אבן מסמא מה שאין כן בהן (ב"ק 1:3)	לְמַעַלְהָ מֵהוּ, זֹבּוֹ שֶׁל זָב וְרוֹקוֹ וְשִׁכְבַת זֵרַעוֹ וּמִימֵי רַגְלָיו, וְדָם הַנִּדְהָ, שֶׁהוּן מְטַמְּאִין בְּמַגַּע וּבְמִשָּׁא (1:3)
Meir	נכנסין לביין האולם ולמזבח מקדש ממנה, ורגלים דברי ר"מ וחכ"א אין נכנסין (ב"ק 1:6)	בֵּין הָאוֹלָם וְלַמִּזְבֵּחַ מִקְדָּשׁ מִמֶּנָּה, שְׂאִין בְּעָלֵי מוֹמִין וּפְרוּעֵי רֹאשׁ נִכְנָסִים לְשֵׁם. הֵהִיכֵל מִקְדָּשׁ מִמֶּנּוּ, שְׂאִין נִכְנָס לְשֵׁם שְׁלֵא רְחוּץ יָדַיִם וְרַגְלִים (1:9)
Yossi	הכסא והספסל וכל מדרס כלי חרס טהורין רבי יוסי אומר אף הספינה ומגופת היוצרין (ב"ק 2:1)	הַטְּהוּרִין שֶׁבְכָלֵי חָרָס, ... וְהַסְפִּינָה ... הָרִי אֵלוֹ טְהוּרִים. (2:3)
Not Yossi	הכסא והספסל וכל מדרס כלי חרס טהורין רבי יוסי אומר אף הספינה ומגופת היוצרין (ב"ק 2:1)	מְגִיפַת הַיּוֹצְרִין שֶׁהוּא פּוֹתַח בָּהּ, טְהוּרָה. וְשֶׁהוּא גּוֹמֵר בָּהּ, טְמֵאָה. (2:4)
Yossi	נפלו משקין על גבי הרחב שלו ר' יוסי אומר משם ר' יוחנן בן נורי חולקין את עביו המשמש את הטמא טמא והמשמש את הטהור טהור (ב"ק 2:2)	בֵּית תְּבֻלִין שֶׁל חָרָס, וְקִלְמָרִים הַמְתַּאֲמוֹת. וּבֵית תְּבֻלִין שֶׁל עֵץ, שֶׁנִּטְמָא אֶחָד בְּמִשְׁקָהּ, לֹא נִטְמָא חִבְרוֹ. רַבִּי יוֹחָנָן בֶּן נוֹרִי אוֹמֵר, חוֹלְקִין אֶת עֲבִיו. הַמְשַׁמֵּשׁ לְטֵמֵא, טֵמֵא. הַמְשַׁמֵּשׁ לְטְהוּר, טְהוּר. (2:7)
Not Yossi	תנור מאימתי מקבל טומאה משהוסק כדי לאפות בו סופגנין רבי יוסי אומר רואין את העצים שהוסק בהן כאילו לא הוסקו לאחר רדיית הפת (ב"ק 4:1)	תְּנוּרָה ... אֵיזְהוּ גְמַר מְלֹאכְתּוֹ, מְשִׁיִּיקָנוּ כְּדִי לְאַפּוֹת בּוֹ סֻפְגָּנִין (5:1)
Meir	שלש אבנים שחברן זו לזו ועשאן תנור ועשה להן טפילה בין מבפנים ובין בחוץ מטמאות במגע ובאוויר דברי ר' מאיר רבי	שְׁלֹשׁ אֲבָנִים שֶׁחִבְרָן זוֹ לְזוֹ וְעִשְׂאוֹן תְּנוּרָה וְעָשָׂה לָהֶן טַפִּילָה בֵּין מִבְּפָנִים וּבֵין בַּחוּץ מְטַמְּאוֹת בְּמַגַּע וּבְאוֹוִיר דְּבַרֵּי ר' מֵאִיר רַבִּי

Meir/Yossi (comments)	Tosefta	Mishnah
	יהודה אומר מבפנים מטמאות במגע ובאור ומבחוץ מטמאות במגע ואין מטמאות באור (ב"ק 4:2)	חֲבֵרָה לֹ, אֶפְלוּ עַל שְׁלֹשׁ אַבְנִים טְמֵאָה. (5:3)
Meir	תנור הניתן בו עפר עד חציו מעפר ולמטה מטמא במגע מעפר ולמעלה מטמא באור דברי ר' מאיר וחכמים אומרים אין חולקין כלי חרס אלא כולה מטמא באור (ב"ק 4:4)	תנור שניתן בו עפר עד חציו, מעפר ולמטה, מטמא במגע. מעפר ולמעלה, מטמא באור (5:6)
Not Yossi	כוורת פחותה פקוקה בקש ומשולשלת לאור תנור ... שרץ בתנור אוכלין שבתוכה טמאין ורבי אליעזר מטהר אמר רבי אליעזר מקל וחומר אם מצלת היא מיד אהל המת החמור אינו דין שתציל מיד כלי חרש הקל א"ר יוחנן בן נורי נמתי לו לר"א אם הצילו אוהלין מיד אוהלין באהל המת שכן חולקין אוהלין יצילו אוהלין מיד אוהלין באהל השרץ שאין חולקין כלי חרש א"ר יוסי נמתי לו לרבי יוחנן בן נורי תמיה אני אם קבל הימך ר"א תשובה אלא תשובה לדבריהם אם הצילו אוהלין מיד אוהלין באהל המת שכן הוא עושה טפח על טפח בבית טהור יצילו אוהלין בשרץ שכן הוא עושה טפח על טפח בכלי חרש טמא אמר רבי היא תשובת רבי יוסי היא תשובת רבי יוחנן בן נורי (ב"ק 6:2)	כֹּוֶרֶת פְּחוּתָהּ וּפְקוּקָהּ בְּקֶשׁ וּמְשֻׁלְשֶׁלֶת לְאוֹר הַתְּנֹרָה... הַשְּׂרָץ בְּתֵנּוֹר, אֲכָלִין שְׁבִתוּכָהּ טְמֵאִין. וְרַבִּי אֱלִיעֶזֶר מְטַהֵר. אָמַר רַבִּי אֱלִיעֶזֶר, אִם הִצִּילָה בְּמַת הַחֲמוֹר, לֹא תִצֵּל בְּכֻלֵּי חָרָס הַקָּל. אָמְרוּ לוֹ, אִם הִצִּילָה בְּמַת הַחֲמוֹר, שְׁכֵן חוֹלְקִים אֹהֲלִים, תִּצֵּל בְּכֻלֵּי חָרָס הַקָּל, שְׁאִין חוֹלְקִים כְּלֵי חָרָס (8:1)
Meir/Yossi (not Yehuda)	פורנא הרי זו טהורה שלא נעשית אלא לשמש עם הקרקע ר' מאיר אומר משם רבן גמליאל אם יש לה לייבז טמאה ר' יהודה אומר משם ר"ג אם יש לה ספונאות ר' יוסי אומר משם ר"ג אם יש לה שפיות וכולן שם אחד הן (ב"ק 6:9)	פּוֹרְנָה, אִם יֵשׁ לָהּ לְזַבֵּז, טְמֵאָה. רַבִּי יְהוּדָה אֹמֵר, אִם יֵשׁ לָהּ אֶסְטִגִּיּוֹת. רַבֵּן גַּמְלִיאֵל אֹמֵר, אִם יֵשׁ לָהּ שְׁפִיּוֹת (8:9)
Meir/Yossi (not Shimon)	רבי מאיר מטמא בגמי מפני שאיגראנמין בודקין את היין רבי יוסי מטמא בגמי מפני שהרופא נותנו על גבי המכה שהוא מוצץ את הליחה (ב"ק 6:10)	וְכֵן חֲתִיכָה שֶׁל לֶפֶת וְשֶׁל גָּמִי. רַבִּי שְׁמֵעוֹן מְטַהֵר בְּשֵׁנֵי אֱלוֹ (9:4)
Not Yossi	א"ר יוסי בא ר' יוחנן בן נורי אצל ר' חלפתא אמר לו מה אתה אומר בפיקה של מתכת אמר לו טמאה אמר לו אף אני אומר כן אלא שעקיבה מטהר (ב"מ 1:2)	פִּיקָה שֶׁל מִתְּכַת, רַבִּי עֲקִיבָא מְטַמֵּא, וְחַכְמַיִם מְטַהֲרִין (11:6)
Meir	מיניקת שעשאה לתחת הדלת אע"פ שמשתמש בה טהורה. היתה טמאה ועשאה לתחת הדלת טמאה עד שתטהר. ומאימתי טהרתה בית שמאי אומרים משיחבל וב"ה אומרים משיחבר דברי ר"מ ר' יהודה אומר	עֲשָׂה בְּרֵאשׁוֹ מְנִיקָתָהּ, וְכֵן בְּדִלְתָהּ, טְהוּרָה. הִיְתָה כְּלֵי וְחֲבֵרָה לֹ, טְמֵאָה. מְאִימְתִי הִיא טְהוּרָתָהּ, בֵּית שְׁמַאי אֹמְרִים, מְשִׁיחֶבֶל. בֵּית הֵלֵל אֹמְרִים, מְשִׁיחֶבֶר (14:2)

Meir/Yossi (comments)	Tosefta	Mishnah
	ב"ש אומרים משיחבל ויחבר וב"ה אומרים משיחבל או משיחבר (ב"מ 4:3 וראה ב"מ 11:3)	
Meir	מפתח של רכובה שנשבר מתוך רכובתו ר"מ מטמא ורבי יהודה מטהר ורבן שמעון בן גמליאל אומר חילוף הדברים (ב"מ 4:7)	מפתח של ארכבה שנשבר מתוך ארכבתו, טהור, רבי יהודה מטמא, מפני שהוא פותח בו מבפנים (14:8)
Not Meir	נפחתה מלמטה ר"מ מטמא וחכמים מטהרין מפני שבטל העיקר בטל הטפלה (ב"מ 10:1)	וכלם שנפחתו, טהורים, מפני שבטל העיקר, ובטלה הטפלה (20:1)
Not Meir (here Yehuda and maybe Yossi)	כסא שקבעו בעריבה כדרך ישיבתו טמא שלא כדרך ישיבתו טהור העשוי בה ב"ש מטמאין וב"ה מטהרין דברי ר"מ ר' יהודה אומר לא נחלקו ב"ש וב"ה על העשוי בה שהוא טהור ושמאי היה מטמא על מה נחלקו על שהביא ממקום אחר וקבעו בה שב"ש מטמאין וב"ה מטהרין א"ר יוסי רואה אני את דברי שמאי שאני אומר מלבן אפילו מבית האומן טמא. (ב"ב 1:3)	כסא שקבעו בערבה, בית שמאי מטמאין, ובית הלל מטהרין. שמאי אומר, אף העשוי בה (22:4)
Not Meir	המטה הכר והכסת של מת ר"מ אומר אין מטמאין מדרס וחכ"א מטמאין מדרס מפני שהנשים יושבות עליהן ומבכות את מתיהן (ב"ב 2:4)	המטה והכר והכסת של מת, הרי אלו טמאין מדרס (23:4)
Not Yossi	רבי יוסי אומר כל הפרגלינין טהורים. וחכמים אומרים שלשה פרגלינין הן של צדי חיה טמא מדרס ושל צדי עופות טמא טמא מת ושל קייצין טהור מכלום (ב"ב 2:4)	שלשה פרגלינין הן. של צדי חיה ועוף, טמא מדרס. של חגבין, טמא טמא מת. ושל קייצין, טהור מכלום (24:15)
Not Yossi	כלי הקדש אין להם אחוריים ותוך ובית הצביעה ואין מטבילין כלים בתוך כלים לקדש א"ר יוסי זה לשון כפול כל שיש לו אחוריים ותוך יש לו בית הצביעה וכל שאין לו אחוריים ותוך אין לו בית הצביעה (ב"ב 3:4)	כלי הקדש אין להם אחוריים ותוך, ואין להם בית צביעה. ואין מטבילין כלים בתוך כלים לקדש (25:9)
Not Meir (here Yehuda)	פחות משלשה על שלשה שהתקינו לפוק בו את המרחץ ולנער בו את הקדרה ולקנח בו את הרחיים מן המוכן טמא ומן שאינו מוכן טהור דברי ר' אליעזר ר' יהושע אומר בין שהוא מן המוכן ובין שאינו מן המוכן טהור דברי ר"מ ר' יהודה אומר ר' אליעזר אומר בין שהוא מן המוכן ובין שאינו מן המוכן טמא ר' יהושע אומר בין מן המוכן ובין שאינו מן המוכן טהור ר"ע אומר מן המוכן טמא ומן שאינו מוכן טהור (ב"ב 6:3)	פחות משלשה על שלשה שהתקינו לפוק בו את המרחץ, לנער בו את הקדרה, לקנח בו את הרחיים, בין מוכן בין שאינו מוכן, טמא, דברי רבי אליעזר. רבי יהושע אומר, בין מן המוכן, בין שאינו מן המוכן, טהור. רבי עקיבא אומר, מן המוכן, טמא. שאינו מן המוכן, טהור (28:2)

Meir/Yossi (comments)	Tosefta	Mishnah
Unclear	כפה של זקנה שהוא טמא מדרס ונתנו לספר ר' מאיר מטהר ור' יוסי מטמא (ב"ב 6:5)	כפה שהוא טמא מדרס, ונתנו על הספר, טהור מן המדרס, אבל טמא טמא מת (28:5)

Ohalot:

Meir/Yossi (comments)	Tosefta	Mishnah
Yossi (It is not clear that anyone disagrees)	ר' יוסי אומר זקנים הראשונים אומרים מקטפרס ולפנים הבית טמא מקטפרס ולחוץ הבית טהור חזרו לומר קטפרס בין מבפנים בין מבחוץ הבית טהור (4:4)	נשפך על האסקפה והיא קטפרס, בין מבפנים בין מבחוץ, והבית מאהיל עליו, טהור. היה אשברן או שקרש, טמא (3:3)
Not Yossi	ר' יוסי אומר טומאה מחצי הכותל ולחוץ מחצי מעזיבה ולמעלה הבית טהור (7:5)	כתל המשמש את הבית, ידון מחצה למחצה. כיצד כתל שהוא לאויר והטמאה בתוכו, מחציו ולפנים, הבית טמא, והעומד מלמעלה טהור. מחציו ולחוץ, הבית טהור (6:3)
Yossi (the Mishnah presents Rabbi Meir arguing with the <i>Tanna Kama</i>)	אין לנפלין פתיחת הקבר עד שעגלו ראש כפיקה של שתי דברי ר' מ' ר' יהודה אומר כפיקה של ערב ר' א' בר' צדוק אומר משיעשו קפופים. אמר ר' יוסי אני אומר דבר אחד והם אמרו דבר אחד אני אומר להן שדרך הטומאה דרכה לצאת ואין דרכה ליכנס והם אמרו לי אין לו ולד טומאה עד שיצא לאויר העולם (8:6)	יצא הראשון מת והשני חי, טהור. הראשון חי והשני מת, טמא. רבי מאיר אומר, בשפיר אחד, טמא. בשני שפירים, טהור (7:5)
Meir	היתה יושבת על שוליה באויר טומאה בתוכה מטמא הנוגע בה מכל מקום טמא דברי ר' מ' וחכ"א אינו טמא אלא כנגד כסויה בלבד (10:6)	היתה יושבת על שוליה והיא כלי, טמאה תחתיה, בתוכה, או על גבה, טמאה בוקעת ועולה, בוקעת ויורדת. היתה גבוהה מן הארץ טפח, או מכסה, או כפויה על פיה, טמאה תחתיה, בתוכה, או על גבה, הכל טמא (9:13)
Not Yossi	עמוד שהיה מוטל באויר אינו מביא טומאה תחת דופן עד שיהא בהיקפו עשרים וארבעה טפחים ר' יוסי אומר עשרים וחמשה (13:7)	עמוד שהוא מטל לאויר, אם יש בהקפו עשרים וארבעה טפחים, מביא את הטמאה תחת דפנו. ואם לאו, טמאה בוקעת ועולה, בוקעת ויורדת (12:7)
Not Yossi	בית שהוא מלא תבן ויש בינו לבין הקורות פותח טפח וטומאה מבפנים כל שכנגד יציאת הטומאה במלואו של פתח טמא ובאכסדרה אינו אלא כנגד הטומאה מן הקורות ולחוץ ור' יוסי אומר תבן שאינו עתיד לפנותו הרי	בית שמלאו עפר או צרורות, ובטלו, וכן פרי של תבואה, או גל של צרורות, אפלו כגלו של עכו, ואפלו טמאה בצד הכלים,

Meir/Yossi (comments)	Tosefta	Mishnah
	הוא כעפר ועפר שהוא עתיד לפנותו הרי הוא כתבן	טמאה בוקעת ועולה, בוקעת ויורדת (15:7)
Not Meir	ר' מ' אומר החורש מלא הטמא ה'ז עושה בית הפרס (17:2)	החורש מלטמא, ... אינו עושה אותה בית פרס (17:3)
Not Yossi	ר' יוסי אומר אע"פ שאין פתחה של עלייה מכוון כנגד של בית עלייה טהורה (17:5)	שדה שאבד קבר בתוכה, ובנה בה בית ועליה על גביו, אם היתה פתחה של עלייה מכוון כנגד פתחו של בית, עליה טהורה. ואם לאו, עליה טמאה (17:5)

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