

“Technology and the Transmission of Oral Tradition in the Contemporary Jewish Community”

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Introduction

This paper focuses on the impact of technology (computers, the Internet, iPods) on the transmission of oral tradition, specifically the cantillation of the Torah, in the contemporary Jewish community. The highly detailed and musically nuanced public recitation of the Torah require that the reader memorize both the pronunciation of unvocalized Hebrew text and the *taamei hamikra* (cantillation marks) that indicate the musical motif applied to each word of scripture. Learning Torah cantillation is a key component of the bar/bat mitzvah ritual. Other cultures have *rites de passage* that require one to endure physical pain or danger. In Judaism--as one cantor expressed--“You have to sing your way in.” In addition, in many congregations across denominational lines, busy lay congregants spend hours every week preparing to “read Torah,” which is the term applied to chanting scripture, at Sabbath services. Many understand this proper performance of sacred text as a way to position themselves at the core of authentic religious experience. ⁱ

Increasingly, these oral traditions are not learned through face to face interaction with cantors, rabbis or other teachers but from computer programs such as “BMitzvah Pro,” “cyberTROPES,” “Navigating the Bible” or “Trope Trainer.” ⁱⁱ Many of these programs can be accessed for free on the Internet. Students download their Torah readings onto their iPods and the locus of instruction, review and practice has transitioned from the *beit midrash* (study hall) to their cars, the elliptical machine in their gym or the subway during their daily commute. In this paper, I examine why certain men and women increasingly see the performance of text as a key to authentic religious expression and how the application of new technology is changing the transmission, study, performance and cultural/religious understanding of these sacred

oral traditions.

Jewish Tradition, Technology and Change in Historical Context

Just as sacred music has always been in transition, the rabbinic tradition in Judaism has been in a creative encounter with technological change since the redaction of the *Mishna* (rabbinic legal code that forms the basis of the Talmud) by Judah HaNasi in 200 C.E.ⁱⁱⁱ The cataclysmic events following the destruction of the second Temple in 70 C.E. and the Hadrianic persecutions of the rabbis in Palestine in the Second Century, C.E. necessitated changes in preserving and recording the oral law. However, certain rabbis viewed the transition from oral recitation to written redaction as highly disruptive. Rabbi Abba quotes Rabbi Yohanan who was unequivocal in his condemnation of the application of this new technology, stating “Writing down *halchot* (laws) is like burning the Torah. The one who studies from these written texts has no reward [for his study]” (Babylonian Talmud, *Temurah* 14b). The concerns that prompted such a strong reaction—the possibility that a student will learn sacred text without a teacher’s supervision, a dilution of the intensity in the relationship between the student and the teacher, a challenge to authority shaped by the individual’s ability to jump from place to place in a codex as opposed to the ordered, hierarchical, linear experience of reading from a scroll—recur throughout Judaism’s encounter with new technologies from the time of the *Mishna* up to the 21st century.^{iv}

So too, the rabbi, philosopher and physician Maimonides generated considerable controversy in the 12th century when he wrote his famous work, the *Mishneh Torah*. Without the aid of a teacher and long years of study, it is very difficult to negotiate one’s way through “the sea of the Talmud.” Maimonides’ reorganization of rabbinic law, which in many ways was a massive computer sort of the Talmud by subject

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matter, was one component of a larger controversy that at one point spilled over to the Dominicans who literally burned his books in the street. ^v While the Maimonidean controversy was essentially a battle between faith and reason, between tradition and Aristotilian philosophy, some feared that the very organization and form of Maimonides' revolutionary 14 volume Mishneh Torah—bolstered by its' dissemination as one of the first Hebrew works printed—would supplant the study of the Talmud, enabling the individual student to step away from the Talmudic academy and the hierarchical control of rabbinic authority. Rabbinic fears notwithstanding, it soon became clear that the Mishneh Torah would never supplant the Talmud but Maimonides' work was so clear, well-ordered and accessible as a Jewish legal code that it soon found a place on bookshelves in yeshivas throughout the Jewish world.

Finally, consider the monumental work now in progress by Adin Steinsaltz who in 1965 founded his Israel Institute for Talmudic Publication. His massive project--translating the Talmud from Aramaic into Hebrew, English and Russian, and incorporating the technology of vocalization and punctuation in the traditional text--has made the Talmud accessible to a range of new learners including women and those who have not gone through a traditional yeshiva education. When questioned about the potential conflict his volumes could cause in traditional homes if these volumes enabled women to discuss and debate Talmudic issues with their husbands, Steinsaltz responded that he is not a feminist and stressed the importance of maintaining peace in the home. Still, he recognized that his volumes were used in women's yeshivahs and even if they enabled women to challenge men, "I never thought that spreading ignorance has any advantage, except for those who are in a position of power and want to deprive others of their rights" (Fagenblat and Carmeli 2004). While Steinsaltz has been held suspect in some ultra Orthodox circles because of his secular learning, and has been criticized for including pictures and secular references in his notes to the Talmud, his editions are widely

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used as tools for study and preparation in Talmudic academies from the most liberal to traditional Orthodox yeshivas. To date, more than 2,000,000 volumes of his work are in print.

Each of these technological changes has had an impact on the transmission of oral tradition. They have empowered the individual learner, stretched traditional control and broadened the student's access to traditional text. While some authorities met these seminal technological innovations with fear and, in certain cases, derision, few of their fears were realized. These technological changes did not destroy the student/teacher relationship, obviate the importance of Talmudic study in traditional Jewish life or create a religious "free for all" where rabbinic authority was essentially undermined. Here we see examples of rabbinic responses to technological innovation marked by concern and opposition followed by accommodation and adoption.

The Musical Realization of the Text

Traditionally, sacred text is never simply read in the synagogue. Scripture is chanted to a set of melodic motifs. We find support for this practice in the Babylonian Talmud, where Rav Shfatiah says in the name of Rav Yohanan, "If one reads Scripture without a melody or learns the Mishna without a tune, of him the Scripture says, "I gave them laws and they were not good (Ezekiel 20:25)" (Babylonian Talmud, *Megillah* 32a). Approximately 1000 years ago, both the cantillation marks and the proper pronunciation of the Hebrew text were codified by the Masoretes, a school of rabbis in Tiberias. These accent marks take the form of 28 symbols that appear both under and above the text. As early as the 11th century, the French rabbi and commentator Rashi uses the term "trop" in reference to chant in the Second Temple (Babylonian Talmud, *Kiddushin* 71a). This term is

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commonly used today, both in Yiddish and English, for the accent signs and their melodies.^{vi}

In the Tiberian system, biblical accentuation serves other functions as well. The placement of the accent signs, in most cases, indicates the stressed syllable of a word, thus the English word, "accent." The third function of the accents is to show the syntactical relationship between words in a verse. The accents indicate the degree of pause a word receives, and whether a word is connected to, or separated from the word following it. In that traditional texts are written without punctuation, the accents help determine the meaning of the text. The Hebrew word for accents, *taamim* (pl. Hebrew, *taam* means sense) reflects this function. In the earliest treatise on the accents, the 10th century *Sefer Dikdukei HaTe'amim*, attributed to Aaron ben Moses ben Asher, the author assumes that it is the purpose of the accentuation to indicate meaning and concludes his first list of accents with Proverbs 3:13, blessing the man who "finds wisdom and produces understanding" (1967:106-8).

Lest one thinks that this function has little practical implications, consider the following contemporized example, where the accent that indicates a medial pause, *etnachta*, is either placed on the word "musicology" or on the word "ethnomusicology."

Example One: "Increased funding will go to musicology, and ethnomusicology and other disciplines with less pressing needs will be considered in turn."

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Example Two "Increased funding will go to musicology and ethnomusicology, and other disciplines with less pressing needs will be considered in turn."

So too, one can point to many examples in the Hebrew Bible where the musical codification of the text has halachic (Jewish legal) impact.^{vii}

While the musical motifs of the accents are fairly simple, the difficulty of preparing and memorizing a long section of Torah to chant from the unvocalized scroll is formidable. Mistakes in pronunciation must be publicly corrected by the *gabbai*, a knowledgeable congregant who checks the accuracy of the reading in a codex while standing next to the reader at the lectern. Yet, in many synagogues, when the reader errs, members will shout out a correction from the congregation. One member of a modern Orthodox synagogue commented, "There is no singular way to get a traditional congregation to quiet down as fast as making some mistakes when you read Torah. Everybody starts to pay you exquisite attention." Another member mused that if you make some mistakes, congregants are "like sharks who smell blood in the water." To which his friend added, "If people think the reader is making mistakes, the whole congregation becomes like people out duck hunting; everybody wants to get one."

And yet, while I've been conducting research on technology and oral tradition over that past ten years, I've found that more and more members of synagogues cross denominationally were volunteering to read Torah in their Reform, Conservative and Orthodox congregations. Doctors, lawyers and business people who were too busy to exercise or come home for dinner were spending hours a week learning how to chant

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Torah. In many interviews, I found that people wanted to read Torah because with this act, they placed themselves at the very center of Jewish spiritual experience, physically standing within the sacred scroll of the Torah, in the focal point of the service, re-creating the revelation at Sinai.^{viii} As one member in an Orthodox synagogue said, "when you're chanting Torah, you're singing God's words in God's own tune." In fact, there is traditional support for the belief that the tunes used to chant the Torah were revealed by God to Moses at Mount Sinai. Rabbi Yehudah HeHasid in the 12th century interpreted the verse from Exodus "God answered Moses *bakol* (Hebrew, with a voice) (Exodus 19:19)" to mean "Moshe transmitted to the Israelites the same melodies that he heard from God" (241:302). In many Reform and Conservative congregations, where leadership of the service has been professionalized as the responsibility of the rabbi and cantor, chanting Torah is one of the few opportunities for the non-professional to inject oneself into the very center of the service.

In addition, parents increasingly see chanting Torah as a way to share the experience as their sons and daughters prepare for bar and bat mitzvahs. I interviewed a woman who runs a dating service in Boston who was motivated to start reading Torah by her daughter's bat mitzvah. She said, "How could I send her up to do something so scary and not be willing to do it myself. So I prepared three verses and thought that was that." To her surprise, she "started to like it and thought, "Wouldn't it be great if I could read the whole darn thing," an accomplishment she completed after seven years of public readings. I asked why she didn't learn how to *daven* (lead prayers) instead and she answered, "I love to sing but I have the kind of voice where people make faces when I do. But Torah has a small range of notes and no one is looking for a major performance. I

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can use my voice in a way that's limited and satisfying." She maintained that for her, the process of learning the cantillation, entailing a deep review of the text, has more of a spiritual dimension than the public reading. She described the anxiety she experienced when reading Torah and said, "... my hands are sweating, I don't know how much my spirit soars, but I do like the adrenaline rush."

Other parents whom I interviewed clearly saw the process of learning Torah as marked with a sense of the sacred even as they worked to fit the time for study into their busy lives. While he was treating our home for termites, the Pestex bug exterminator, who knows that I am a rabbi, enthusiastically described how he decided to read Torah in his large Conservative synagogue so that he could be more involved in his daughter's bat mitzvah. He said, "I was practicing in my Pestex truck on Route 128 at 60 miles an hour, singing out the window with the tape of the accents at the top of my lungs. I checked a piece of paper with the trop signs and almost crashed into the car in front of me (laughs)! I'm convinced that I avoided the accident because I was practicing Torah!"

Technological Innovation in Teaching Torah Cantillation

Allow me to describe how I, and many people, learned to chant Torah and *Haftarah* (selections from the Prophets read on the Sabbath) when I prepared for my bar mitzvah in 1962. For about six months, twice a week, I sat in a little room in the basement of our

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synagogue with the ritual director, Harry Rearson. He would sing the musical motifs of each accent set to the accent's name and I would sing them back to him. We would work on grouping of accents and then gradually, after I learned the melody of each accent, we worked on applying it to my Torah portion and to my Haftarah. I heard that some people in New York actually had record albums with their Haftarah recorded by a cantor but I had never seen such a thing. By the early 1970s, cassette tapes became the preferred medium for learning Torah and Haftarah cantillation and it was common for cantors, or knowledgeable tutors, to give students a tape with the accents, blessings and the entire Torah portion and Haftarah they would be reading at their bar/bat mitzvah. Yet, this created a problem. More and more bar/bat mitzvah students simply memorized the tape of their portion without learning the system that could then be applied to learning another Haftarah or Torah readings. In the late 1980s, a number of companies set out to address these issues and developed computer programs to teach Torah and Haftarah cantillation. Among the pioneers in this field are Shira and Benjamin Levy, a couple whom I interviewed when their first products, Haftutor and Trop Tutor, were released in 1990.

The Levys developed a relatively simple program and spent a prodigious amount of time keying in the cantillation marks for each word in the five books of the Torah and the corresponding *Haftarot* (pl.). The motifs of the accents were played as computer generated notes and the program included nice touches such as a cursor in the shape of a *yad*, a pointer shaped like a hand with a pointing finger, corresponding to the pointer one uses when reading Torah. One could toggle back and forth, either displaying the Hebrew text with or without the punctuation and accent marks, and displaying the text with Hebrew transliteration and/or English translation. It was also possible to change the speed

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and musical key. Their programs were geared to the needs of adult learners, who are often embarrassed by their lack of traditional Jewish knowledge and wish to learn, or review, these skills in private. The Levys also hoped to make learning how to chant Torah and Haftarah easier and more appealing to twelve and thirteen year olds preparing for their bar and bat mitzvah. In the past seventeen years, their company Lev Software had developed more sophisticated programs for teaching cantillation such as BMitzvah Pro.

Benjamin Levy reflected on the difference between this program and the use of cassette tapes, noting that the major advantage was that the computer allowed the student to see the text and hear the audio simultaneously. He also underscored various other problems when learning primarily with a cassette tape, "It's just parrot memorizing and ... if you forget, it's difficult to rewind and go back." But more than that, the computer program forced the student to add his or her own voice to study. "This is not a synthesized voice at all. It's a melody guide and what this does, immediately, is to force the student to sing with their own voice ... you have to do it with your voice and then you are on your way." Furthermore, on a tape, a cantor's voice could be intimidating and alienating. Levy continued, "Being a thirteen year old, you would never sound like a seasoned cantor..." Gender issues were also considered: "If you are a girl and the cantor is male... If you get a tape, how could you ever sound like that? I think a tape misses the mark by a lot." He stressed that the system was never meant to replace a teacher, but rather to supplement the teacher and provide a better method for practice. Shira Levy also stressed that the use of a computer program enabled egalitarian access for more traditional women who now wished to learn how to chant Torah and Haftarah. She explained, "As an Orthodox

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women, I never had a bat mitzvah and now they can [learn how to chant] in the privacy of their own home. If they are embarrassed because they don't want to go to a class, it's frustrating, ... not everybody is at the same level and as an adult you have less time and less patience. So it's worked for quite a lot of people who have wanted to do this for a long time.” In most Orthodox settings, women do not read Torah but since the 1990s, more opportunities have developed for traditional women to chant scripture in women’s services or more liberal Orthodox settings. These computer programs facilitate study for traditional adult learners.

But what was especially notable about the early versions of BMitzvah Pro, Trop Tutor and Haftutor, is that the programs were conceived as being customized to teach the musical traditions of a particular synagogue. Benjamin Levy commented, "Why should anybody have our trop? Who are *we* to *them*?" In their early days, Lev Software collected traditions from approximately 150 different synagogues. As a default system, they used the Binder trop, the standard trop taught at the Reform movement's School of Sacred Music at the Hebrew Union College-Jewish Institute of Religion in New York (Binder 1959). But the majority of their programs were created when cantors sent a tape of their trop that Benjamin and Shira would then transcribe. The program you ordered would play your own trop tradition. As their business grew, it became too difficult and subjective for them to do the transcription, so they requested a transcription from the cantor, rabbi or educator. As such, this technology was helping to preserve musical traditions of specific synagogues, albeit with computer generated sound. This is consonant with Peter Manuel's observations about the effect of the cassette industry on popular music in North India. One might expect mass distributed technology, such as cassette tapes, and in this

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case computer programs, to level and standardize local traditions. Yet Manuel observed that cassettes also "decentralized and diversified the music industry" in North India, and by "...offering a greater variety of products and drawing extensively from the rich "little traditions" of regional musics, cassettes are able to affirm a sense of local community and revitalize traditions, rather than obliterating them..." (Manuel 1991:203). It appeared that the work of Lev Software was preserving and teaching local traditions of scriptural cantillation.

Yet, over the past fifteen years, Lev Software has gone in a different direction. They are still willing to customize the program if a customer requests so. Yet, upon considering the traditions of the 150 synagogues they collected, they perceived only minor differences among the cantillation traditions of these North American synagogues. Furthermore, they found that they were not always sent the traditions that cantors used in performance. Many cantors were modifying and simplifying their trop so it was easier for their students to learn. This realization, coupled with the fact that it was expensive and time-consuming to customize each program, led them to a different approach. They felt that the vast majority of trop they were being sent basically fell into three systems which they have named European Ashkenaz--Binder, North American--combination of Binder and Rozovsky (Rozovsky 1957) and Israel Yerushalayim--Sephardic Israeli. In their new program, you have the option of choosing one of these three systems, an approach they say satisfies almost all of their customers.

Here we see a variety of factors shaping contemporary Jewish oral traditions of Torah cantillation. The company directors are making a studied, yet subjective assessment of

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what constitutes “standard” traditions in dynamic relationship with their consumers--students, tutors, educators, cantors and rabbis. Economic factors, such as the cost and time it takes to program specific traditions, play a factor in their decisions. In practice, we see how traditions are shaped, canonized, preserved and named.

I interviewed Cantor Roy Einhorn, who works in a large Reform Temple in Boston and at the time of this writing was using BMitzvah Pro projected on a large screen with forty-five of their pre-bar/bat mitzvah students. He was enthusiastic about certain aspects of this program, stressing that kids were drawn to the computers and the program made learning cantillation “cool.” Furthermore, he explained that while he regularly met with his students, in this 1500 member congregation, he had many other responsibilities and by using this program, “I don't have to be there all the time.” He also said that while the bar/bat mitzvah tutors he hired were knowledgeable, with the support of this program, they did not have to be “experts.”

Still, he had problems with the program that kept him from recommending it for purchase by every student. He said, “I worry about the syncopated nature of the notes because the computer can't bend [conveying the conjunctive function of certain accents.] It's hard to get the vocal nuances.” He pointed to an example of another problem, where the program sometimes ignores the meteg, a diacritical mark indicating secondary stress. He emphasized that accuracy was especially important when teaching cantillation.

A small company in Fairfield, Connecticut named cyberTROPES, Inc. has taken a different approach to teaching Torah and Haftarah cantillation by computer.

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CyberTROPES' program is more limited in scope than either BMitzvah Pro or Navigating the Bible, another program I consider below. CyberTROPES does not present any Torah or Haftarah text but rather allows a student to do self-tutorial and drill with the program in order to learn the individual accents or sequences of accents. In their website's list of Frequently Asked Questions, they pose the question: "Whose tropes do you use?" Their answer is: "We use your tropes! Why should you use anyone else's?" A teacher sends a recording of the accents and for a one-time customization charge, they record the program with your voice and a piano rendition of your trop. This is mostly marketed to teachers and the company gives discounts for multiple purchases. It is also possible to purchase the program with a set program of what they call "traditional tropes," which are taken from Binder's notation. They also have a disk with a set of trop that the company founder, Jackie Eskin referred to as "trope by committee," where members of their synagogue came together and agreed on a standardized system that they felt was representative of their collective traditions and easy to teach to students.

Modest in scope, this program provides an interactive system, where according to their material, "There is no confusion for your students. They hear your voice and your melodies." The website continues, "Students learn at their own pace to become proficient Torah and Haftarah readers - a skill they can use anywhere." This program only teaches the system for Torah and Haftarah cantillation and as such, unlike a cassette tape, it is impossible for the student to commit a Torah portion or a Haftarah to memory.

The final program I consider, Navigating the Bible, is an educational *tour de force* produced by ORT, a private international Jewish educational organization based in

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London. The program advertises, "Explore the Five Books of Moses in sound and sight on one interactive CD-Rom!" It features the full text of the Torah, all of the Haftarat, blessings and accents sung by Cantor Moshe Haschel of London, sung in what he describes as the Lithuanian (East European) style. It is possible to quickly find any *aliah*, a particular Torah section to be read, and toggle back and forth between vocalized and unvocalized text. The program also includes English transliteration and translation, the blessings one recites before and after a section of Torah is read, musical notations of the accents, a Hebrew calendar to calculate the date of a bar/bat mitzvah or find the scripture readings for any week up to 2050. It also includes commentary on the Torah portions, a search program for the entire Torah and additional material on customs and traditions.

A major concern that students and teachers raised about this program is that the student is presented with one cantor's tradition of the trop. I spoke with Cantor Scott Sokol, presently the Dean of the Jewish Music Institute at Hebrew College in Boston, who is familiar with Navigating the Bible. While he recommended the program, he had several reservations about using it with his students. Cantor Sokol spoke from his experience as a cantor in a large Conservative congregation and explained how the cantorial style used in this program was overly formal and potentially off-putting. He said, "Kids don't respond well to *"bimah* voice," by which he meant the formal, operatic vocal style that some cantors adopt when praying on the bimah, the raised platform before the congregation. He also explained that practically, a simpler, less ornamental style was easier to teach. But more than that, he stressed that "It didn't allow me to have my kids listening to the trop that I wanted them to learn. He said, "I wanted every kid who I worked with, when they came to a bar/bat mitzvah and heard their friend chanting say, 'Yeah, I know that.' It

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sets a community standard.” He understood common musical traditions as a way for a synagogue to build and re-enforce community. Even though he was quick to say that Cantor Haschel's system was certainly an authentic system, it wasn't *his* authentic system and introducing it to their congregation would be confusing and weaken their sense of community solidarity.

During the past two years, with the help of the students in my ethnomusicology class “Music and Prayer in the Jewish Tradition,” I’ve conducted interviews with rabbis, cantors, educators and congregants at twenty synagogues in the greater Boston area from the three major denominations to assess their use of technology in bar/bat mitzvah education programs. Only two of these congregations systematically used computer programs to teach cantillation in their preparatory programs. In both, computers were used for practice drills, integrated with teachers’ one-on-one involvement with the students. In fact, many parents felt that one of the most important aspects of bar/bar mitzvah training was the close personal relationships that the children developed with rabbis, cantors and tutors. These parents focused less on the accuracy of the transmission of musical traditions than the positive experience they hoped their children would have in the process of preparation. Parents valued the opportunity for their children to deepen relationships with teachers whom they saw as role models for Jewish life and practice. In two thirds of these synagogues, teachers distributed compact discs of trop, blessings, Torah and Haftarah portions which many students quickly downloaded onto their iPods. A third of the educators were embarrassed to admit that they still used, and distributed, cassette tapes. Students expressed a strong preference for compact discs and down-loaded files, where each biblical verse is commonly recorded on a single track and it is much

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easier to find one's place. Still, there was a strong tendency to use these recordings to memorize blocks of text rather than learn the system of biblical chant. In fact, it was the parents of these twelve and thirteen year olds, as well as other adult learners,^{ix} who spoke most often about their use of these computer programs and free cantillation resources on various websites. Adults used these programs to work their preparation into their busy schedules, brush up on rusty skills in private and double check the motif of an obscure accent. Parents who had stopped going to synagogue before their children began religious school used these programs so, as one parent reported, they "would not be clueless" when their child had a question about their bar/bat mitzvah preparation. Less traditionally observant Jews would use these resources to review a Torah reading late Friday night on the Sabbath before they were reading Torah, a time when the cantor or rabbi would not be accessible for a question. In fact, just as some rabbis feared, technology continues to empower the individual learner and provides the opportunity, if one chooses, to develop basic cultural competence, what Mark Slobin calls "methodologies of belonging" (Summit 2000:160, n.21), without fully belonging to the community, participating on a weekly basis and accepting the authority that regulates community practice.

Conclusions

In the past, when people learned cantillation, they followed *minhag avotenu*, the traditions of their family. If you did not have family traditions, you followed the traditions of your teacher. Yet, as more Jews wish to learn and adopt "authentic" traditions, they are presented with shifting loci of authority, such as the computer programs considered above. Many factors have contributed to the development of

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computer technology to teach cantillation, such as the excitement of using innovative, interactive technology to teach oral traditions, the desire to make this material appealing to the bar/bat mitzvah student and the need to create personalized learning opportunities for busy professionals. As these programs develop, we see that economic and pedagogic factors may contribute to the standardization and simplification of certain oral traditions. At the same time, these developments are mediated by the involvement of cantors and other teachers who desire to maintain community traditions and present an accurate, nuanced performance of sacred text. Both students and teachers negotiate these factors as they prepare to place themselves at the core of what they see to be authentic religious experience, singing God's words in God's own tune.

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ⁱ Also compare the recent increase in interest in the recitation of the Qur'an. See Nelson (1985); Gade (2004).

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ⁱⁱ The website for BMitzah Pro is <http://www.levsoftware.com/bmitzvah.htm>. The cyberTROPES website is <http://www.cybertropes.com/>. Navigating the Bible is <http://bible.ort.org/>. For Trope Trainer, which is not examined in this paper, as well as a range of other programs, see <http://www.jewishsoftware.com/default.asp?page=category&id=571>.

ⁱⁱⁱ While in this article I focus on technological innovations such as computers and computer programs, here I am considering technology as expressed in the definition given by the International Technology Education Association: "Broadly speaking, technology is how people modify the natural world to suit their own purposes. From the Greek word *techne*, meaning art or artifice or craft, technology literally means the act of making or crafting, but more generally it refers to the diverse collection of processes and knowledge that people use to extend human abilities and to satisfy human needs and wants" (Smith 2000:2)

^{iv} For a series of contemporary commentaries on this passage, see the section "*NiSh'ma*" (Hebrew, Let us hear) in the edition of the journal *Sh'ma* that examines text and technology (Berrin 1999:10).

^v For an examination of the Maimonidean Controversy see Silver 1965.

^{vi} For a full discussion of the function of the Tiberian accents see Jacobson's comprehensive work (2002). Also see Wickes 1970. For a discussion of the accents and their possible connection with homiletic interpretations, see Weisberg 1966/67; Cohen 1972.

^{vii} See Miles Cohen's discussion of Exodus 12:8 and how the Masoretic placement of the accents clarifies the manner in which foods are required to be eaten on the holiday of Passover (1969:2).

^{viii} See Langer's examination of the development of the Torah service as a reenactment of the revelation at Mount Sinai (1998).

^{ix} These programs are increasingly used by Jews in isolated communities, or stationed in the military, where access to qualified teachers is limited. See the entry in "Jews in Green," an Internet journal for Jews in the armed forces, that lists web based resources for cantillation: <http://www.jewsingreen.com/home/weblog/comments/503/>.

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