

The Effect of Pilates Respiration-Based Classical Vocal Technique on Student's Vocal Performance: A Single Case Study

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บทคัดย่อ

การวิจัยในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาประสิทธิผลของการร้องคลาสสิกตามหลักการหายใจแบบพิลาทิส ที่มีต่อทักษะการร้องเพลงคลาสสิกของนักเรียน ผู้เข้าร่วมวิจัย คือ นักเรียนที่ผ่านการเรียนร้องแบบร้องแบบร่วมสมัยและคลาสสิกจำนวน 1 คน การวิจัยในครั้งนี้ใช้ระเบียบวิธีวิจัยกรณีศึกษากรณีเดียว (เอ-บี) การทดลองประกอบด้วยระยะ ระบบการสอนเดิม (เอ) และ กิจกรรมการทดลอง (บี) เครื่องมือที่ใช้ประเมินผลทักษะการขับร้องคือ แบบประเมินผลรูบริคส์ต่อทักษะการร้องเพลงคลาสสิก การวิจัยในครั้งนี้นำเสนอผลการวิเคราะห์ข้อมูลในรูปแบบภาพกราฟเส้นวิเคราะห์ผล เพื่อแสดงผลการพัฒนาในทักษะการขับร้องของนักเรียน

ผลการวิจัยพบว่าในระยะ ระบบการสอนเดิม (เอ) ผู้เข้าร่วมมีการหายใจที่ไม่เพียงพอในการร้องเพลงและไม่สามารถใช้กล้ามเนื้อในการส่งเสริมการร้องได้อย่างเหมาะสม โดยทำให้ใช้โทนเสียงในการร้องเพลงอย่างไม่มีประสิทธิภาพ เมื่อผู้เข้าร่วมได้รับการสอนการร้องคลาสสิกตามหลักการหายใจแบบพิลาทิส (บี) ในครั้งที่สองและครั้งที่สาม ทักษะในการร้องเพลงของผู้เข้าร่วมค่อยๆ พัฒนาขึ้นอย่างต่อเนื่องจนถึงระยะสุดท้าย การใช้ระบบการหายใจแบบพิลาทิสเพื่อนำไปประยุกต์ใช้ต่อการร้องเพลงคลาสสิกในครั้งนี้พบว่า ผู้เข้าร่วมมีการพัฒนาทักษะการร้องเพลงคลาสสิกได้อย่างมีประสิทธิภาพ

คำสำคัญ: ระบบการหายใจแบบพิลาทิส, เทคนิคการขับร้องคลาสสิก, นักเรียนเอกขับร้อง

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ABSTRACT

The purpose of this study was to examine the effectiveness of Pilates Respiration-Based Classical Vocal Technique (PRBC) on student vocal performance. The participant was a university student trained in contemporary and classical singing. The single-case (AB) design was employed in this study to examine the data between baseline session (A) and intervention session (B). The Classical Voice Rubrics Assessment was used to measure vocal performance outcomes, with findings presented by visual inspection.

The results revealed that during baseline sessions, the participant was found to be not breathing sufficiently and not engaging his muscle supports during singing, which caused improper delivery of voice tones. His vocal performances showed some progress during the second and third intervention sessions, then continuous improvement in respiration and vocalization from the third and fourth sessions, until the last intervention session, when significant results were sustained. Regarding PRBC, the participant demonstrated improvement in the tonal quality of his singing, as well as; 1) Breathing management, 2) Phrase duration, 3) Intonation/ Pitch, and 4) Tonal quality/ Interpretation. Thus, the results of this study present that PRBC enhanced the classical voice performance of the participant.

Keywords: Pilates respiration, Classical voice technique, and Vocal Student.

1. Introduction

The singing voice is an instrument that humans have been using for a long period of time. There are a number of singing methods that have been developed to help singers improve their singing voice and techniques to express the tone and quality. Essentially, voice instructors need to identify students' problems and

combine necessary strategies to address them during lessons. There have been a variety of studies that point out the importance of such singing techniques, which are related to active breathing and are the primitive source of vocalization.³

Breathing is a part of the respiration system and it is very important for students to understand their own body function as a whole, rather than know merely to “breathe deeply”. Therefore, many students find it hard to engage their abdominal muscles with breathing and to combine the kinematic function with their body.⁴ The correct breathing is necessary for singers to project sound within one inhalation of classical resonance. Vocal cords are moved and vibrated by the force of air (exhalation), muscle and larynx move for phonation in the mouth region.⁵ Most importantly, voice instructors need to deliberate the complex problems that students confront, and assist them with theoretical and practical pedagogy to fix the problems.

The Young Artist’s programs at the College of Music, Mahidol University, found common technical problems with classical voice students. Many new learners struggle with uncomfortable body alignment and vocal agility control. In fact, they learn in different contexts, languages, and historical music knowledge. All these make it harder for students to feel comfortable enough to allow themselves to sing effectively. Most of them lack inspiration and capacity, and use the wrong muscles to support singing. The problems indicate that they cannot breathe and lower the diaphragm to expand the ribcage to allow intercostal muscle actions, which control the vocal range and quality. The investigation of common problems found that they had a lot of tensions at tongue and jaw, and lacked active-breathing techniques. Additionally, there are problems with language difficulties, consonants, vowels and dictions. In addition, the

³ Denes Striny, *Head First: Bel Canto and Head Voice, What happened?* (Lanham, MD: Hamilton books acquisitions department, 2007), 13-15.

⁴ Dawn W. Neely, “Body conscious: A comparative study of body awareness and body alignment methods for singers” (Doctoral diss., The University of Alabama, 2012), 111.

⁵ Marina Markovic, *Actor’s voice: Intercostal-abdominal breathing* (Belgrade, Serbia: CLIO Publishing Company, 2002), 2-3.

most notable problem in males is the voice register in middle and low voice, while in females is the middle and high voice (high larynx position).⁶

The scientist indicates that proper breathing helps intercostal muscle to work effectively and beneficially for singers. This however proper breathing technique can potentially harm the vocal chords, singers should therefore not exert excessive effort in muscle contraction or tension.⁷ Kloubec found that the Pilates respiration is similar to the vocal breathing pedagogies. Adult Pilates are used to improve the posture and respiration through the body's kinematic function. The core capacity after exercises shows that proper posture helps singers to be ready for their professional field.⁸ The related studies support the Pilates method, which is potentially important to the vocalist's physical improvement. Connecting physical features to the mind helps singers gain awareness while they perform on stage. Additionally, Pilates is essential for vocal training and improves the strengthening of muscles, mental consciousness, and body flexibilities by clinical experiments.⁹ Not only does Pilates improve breathing, but also develops body and mind awareness, which allows singers to apply techniques and focus on breathing while singing.¹⁰

As mentioned above, application of the Pilates respiration method is essential for singing. Unfortunately to date there has been no comprehensive study of the technique and its proven benefit to classical voice performance.

⁶ K. Subhakarn, "The Common vocal problems in western classical vocal performance encountered by Thai students of Mahidol university at the Pre-college and undergraduate level" (Graduate recital document, Mahidol University, 2013), 15-23.

⁷ Marina Markovic, 2.

⁸ J. A. Kloubec, "Pilates exercise for improvement of muscle endurance, flexibility, balance and posture," *Journal of Strength and Conditioning Research* 24, 3 (2010): 661-662.

⁹ Veera K. Asher, "The Olympic singer: Integrating Pilates training into the voice studio" (Unpublished doctoral diss., University of Nevada, Las Vegas, 2009), 73-75.

¹⁰ Joan Melton, "Pilates training and the actor/singer," accessed February 10, 2016, www.joanmelton.com/pilates-training-and-actorsinger.

2. The purpose of this study

The purpose of this study was to investigate the effectiveness of Pilates respiration-based classical vocal technique on student vocal performance skills.

3. Methodology

In this study, a single-case experimental design was employed in order to examine the effect of the Pilates respiration-based classical vocal technique (PRBC) on the student's vocal performances.

3.1 Participant

The participant was a classical voice student, qualified according to the criteria. After the study was approved by MU-SSIRB, the participant was asked to sign the participant information sheet and consent form in order to participate in this study. According to the study, the simulation factors guided the participant to understand the function of the phonation mechanism by being taught the PRBC exercises. He was 26-year-old male tenor, who had obtained his bachelor degree in music, with a major performance in "Contemporary Voice." He studied a classical-voice basic lesson in one semester of his undergraduate study. He was selected to participate in this intervention through classical voice performance forms. Before this study started, the participant exhibited difficulty in breathing control and using muscles to support singing classical music. Moreover, he demonstrated a problem with body tensions around his neck, upper torso and middle torso, all of which limited him to singing in higher ranges. The tonal quality of his middle register was thus restrained. Due to difficulty with posture, he could not freely express himself while singing, which resulted in constriction of the sternocleidomastoids venter superior and trapezius muscles while singing.

3.2 Baseline

In the baseline sessions, the participant took classical voice lessons for a total of four sessions in a music studio at the College of Music, Mahidol University. The

programs included breathing techniques and exercises, “The Acquisition of Agility” by Miller¹¹, vocal exercises, different scale patterns, and song “Caro mio ben.” No Pilates took place in the baseline phase. In addition, the classical voice lessons were held to collect data of the participant for 50 minutes.

3.3 Intervention Strategies

This intervention combined two experimental strategies. First, each session began with the introduction of Pilates respiration for the participant to understand the Pilates respiration and anatomical-related information. Next, this step allowed the participant to start learning one of the intervention components, which is the Pilates respiration-based classical vocal technique (PRBC). The student experienced the engagement of body and mind control, which is connected to his physical awareness of the intervention methods, thoracic cavity, abdominal muscles and pelvic floor muscles. Having followed the training for 10 minutes, the next method was private voice classes. The classical-voice session lasted for 50 minutes, and consisted of vocal exercises guided by the book “The structure of singing.” The participant learned two items of music literature. The participant then engaged in singing classical voice lessons, by combining treatments to improve their performances, for approximately 60 minutes in ten intervention sessions. Each session included five procedures: 1) PRBC, which consisted of lateral breathing, diaphragmatic, breathing on neutral supine and pelvic floor muscles, 2) integration exercises, 3) “The acquisition of agility” method, 4) Vocal warm up/ exercises, and 5) repertoires which included “Caro mio ben” with “Steal away”. These are illustrated in the summary of intervention strategy procedure

¹¹ Richard Miller, *The Structure of singing: System and art in vocal technique* (Belmont, CA: Wadsworth Group,1996), 42-47.

3.4 Dependent Measures

This research collected data from the participant by The Classical Voice Rubrics Assessment. This instrument helped clarify the expectations on student's performances by providing the descriptive objectivities. The criteria aimed to evaluate the level of criteria that included four items: 1) breathing management, 2) phrase duration, 3) intonation/pitch, and 4) tonal quality and interpretation. In addition, each item of Classical Voice Rubrics Assessment was categorized into five performance levels: 1) poor, 2) minimal, 3) sufficient, 4) above average, and 5) excellent.

3.5 Data Collection

In this study, data was collected through the observation at the end of all sessions and the subsequent observation on videos. The Classical Voice Rubrics Assessment forms were used to collect data by identifying the level of participant's vocal performances; (phase A) for 4 baseline sessions. Each session lasted for 50 minutes, with regular classical voice lessons. Then, he took the intervention sessions (phase B) for 10 sessions. Each session lasted for 60 minutes. The observers identified and rated participant's performance level, which were categorized into one of the 5 score levels, specifically: 1) Poor, 2) Minimal, 3) Sufficient, 4) Above average, and 5) Excellent. All sessions were video recorded for subsequent assessment of actual vocal improvement.

3.6 Inter-rater Reliability

The Pearson's product showed the consistency between the two observers. The inter-rater reliability of breathing management section indicated a strongly significant result in statistical correlation ($r = .87, p < .05$). In addition, the phrase duration section showed a strongly significant correlation ($r = 1.0, p < .01$). The inter-rater reliability of the intonation/ pitch ($r = .87, p < .05$) demonstrated high agreement rates between the two observers. However, Tonal quality/ Interpretation did not reveal a strong correlation ($r = .33, p = .02$) between the two observers.

3.7 Data Analysis

Visual analysis: The data collection is demonstrated in detail by the visual inspection of resulting graphs. According to this study, the observation data of classical voice performance was analyzed by the baseline and treatment periods. The participant's performance is represented in the statistical analysis graphs, which exhibit the level changes and trend in performance competency.

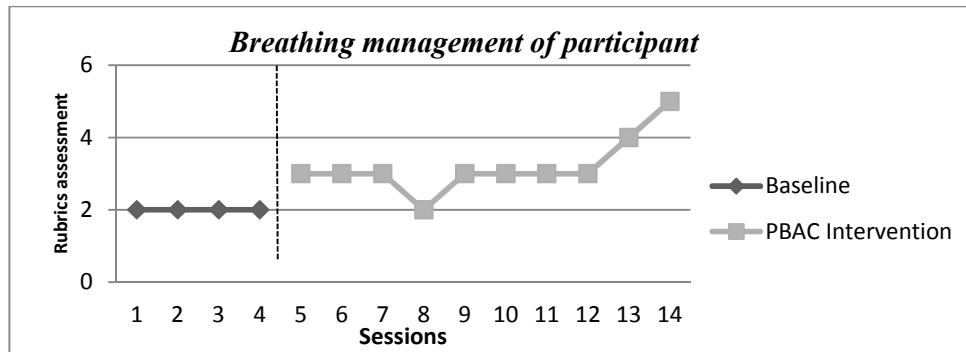
4. Findings

The purpose of this study was to investigate the Pilates Respiration-Based Classical Vocal Technique in student vocal performances. This section presents the findings of a case study that consist of visual analysis of classical vocal performance, including 1) Breathing Management, 2) Phrase Duration, 3) Intonation/ Pitch, and 4) Tonal Quality/ Interpretation. Details are discussed below.

4.1 Breathing Management

During baseline sessions, the participant managed to breathe deeply and audibly. His upper chest was lifted, and some tension was expressed at his neck muscle, with mean occurrence of 2 and the range of 2. The result that was reflected constantly was a score of 2 from session 1 to session 4. During the intervention session, the mean occurrence was 3.2 and the range was 3 to 5. The scores were reflected constantly from session 5 to session 7. In session 8, the participant learned the second song; thus, his inhalation control dropped to 2. In session 9 it slightly increased to score 3 and remained at the same range until session 12. The scores were improved to 4 in session 13, and gradually improved to 5 in session 14, as shown in Figure 4.1.

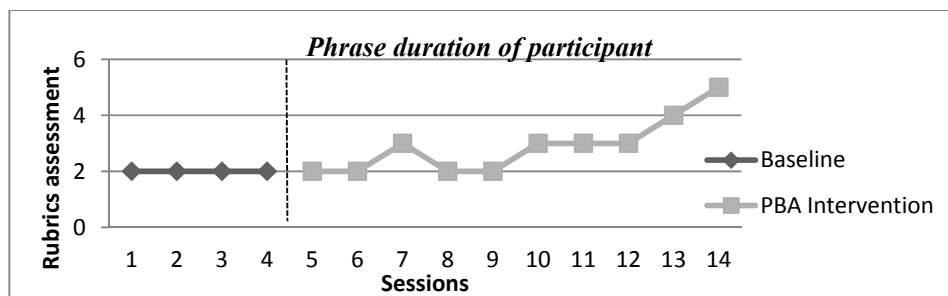
Figure 4.1 Rating scale's numbers of breathing management



4.2 Phrase Duration

During the baseline session, his phrase management while singing remained constant at 2, with mean occurrence of 2 and range of 2. After introducing the treatment, the score increased to level 3, with mean occurrence of 2.9 and range of 2 to 5. After three treatment sessions, the score from session 8 to 9 dropped to 2 at the second song (Steal away). From session 10 to 12, the score was constant. The score increased slightly to 4 in session 13, and to 5 in session 14, as shown in Figure 4.2.

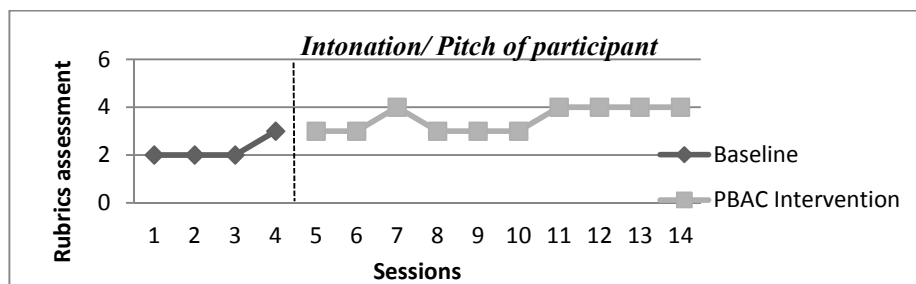
Figure 4.2 Rating scale's numbers of phrase duration



4.3 Intonation/Pitch

During session 1 to 3, the score of the participant was 2. In the 4th session (baseline), he scored 3, with a mean occurrence of 2.25 at the range of 2 to 3. The score for the next intervention session remained constant from the last baseline session to treatment session 5 and 6. The score improved to 4, with a mean occurrence of 3.5 at the range of 3 to 4. At the second song, the score suddenly dropped to 3 and remained there for three sessions: from session 8 to 10. In the next session, the score increased from 3 to 4 and remained constant throughout the final four sessions: from session 11 to 14, as shown in Figure 4.3

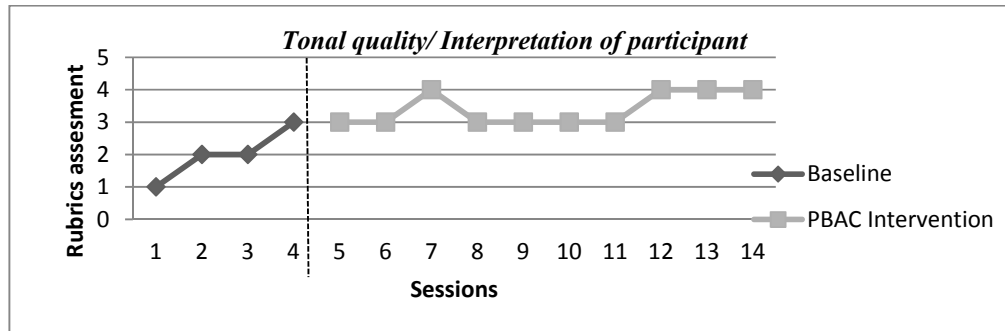
Figure 4.3 Rating scale's numbers of intonation/ pitch



4.4 Tonal Quality/Interpretation

The participant scored 1 for his first song (Caro mio ben). The next score of session 2 and 3 rose to 2, with a mean occurrence of 2 and a range of 1 to 3. In the last baseline session, the score improved to 3, and remained until the treatment session 5 and 6. The last session (7) of the first song, score improved to 4, with a mean occurrence of 3.4 at the range of 3 to 4. In session 8, the score dropped to 3 and remained stable until session 11. The last three sessions, 12 to 14, the score increased to 4, as shown in Figure 4.4.

Figure 4.4 Rating scale's numbers of tonal quality/Interpretation



5. Discussion

5.1 The Pilates Respiration-Based Classical Vocal Technique and breathing management

While the participant inhaled audibly, he elevated his upper chest with most tension at the neck. This problem caused ineffective coordination of beneficial musculatures, which made it difficult to breathe deeply and his figure was poorly imparted while singing. He made progress with breathing management in the 9th to 12th sessions and scored 3 and developed continuously to score 4 and 5 in the last two sessions. Thus, he fully developed in body control with relaxation during his last intervention session. In addition, during the individual sessions, the participant was able to develop his breathing control in each session during learning hours. Thus, the research proved that Pilates breathing technique was able to help the singer to improve his breathing performance, as Friedlander stated, singers should emphasis on building up a substantial air reserve and focus on the “pushing” tendency of their abdominals. Pilates-respiration training is a method that helps singers to sustain the breathing mechanism during stage performances.¹² This is because the breathing

¹² Claudia Friedlander, “Sports-specific training for the vocal athlete, part 1,” accessed January 10, 2016, www.claudiafriedlander.com

technique supports the core-muscle exercises that systematize the joint of lower spine, hips and pelvis and balanced lower torso.

5.2 The Pilates Respiration-Based Classical Vocal Technique and phrase duration

There were some difficulties for him to engage the breathing modification to his muscle support. He had excessive tension along his upper abdomen leading to neck tension, which caused inconsistently balanced air emission. This caused his head tone to be limited and he regularly could not sing through the end of phrases. During these periods, he could follow the instructions, but there was some tension around his trunk muscles and this caused the sound to be restrained on his voice. Next, at session 10, he managed to sing through the phrases and control his breathing with less tension, but only with some difficulties on the long suspension notes. Thus, this study proved that the PRBC method contributed to the participant's ability to control singing phrases, as Asher found, writing about the importance of this method and concluding that the Pilates breathing method impacts on the pelvic floor C-Curve, regulating the force of inhalations, by strengthening the lumbar multifidus functioning with spinal vertebrae of the singers. The most important function of breathing is to empower the diaphragm and engage the pelvic floor muscles to be more flexible. Moreover, this function strengthens the downward abdominal muscles that relate to transversus abdominis.¹³ Thus, the effective breath training helps singers to maximize high volume of air pressure by coordination between body and mind.

5.3 The Pilates Respiration-Based Classical Vocal Technique and Intonation/Pitch

During baseline sessions, the participant had difficulty with voice resonance. His voice occasionally sounded restrained in the throat region and off key (flat) while singing in higher ranges. On the other hand, he managed to sing properly on pitch at

¹³ Veera K. Asher, 104-106.

the lower and medium registers. In these ranges, it was observed that he tried to combine his breathing musculature to support the head voice, but still could not engage the appropriate muscles to enable him to sing with head tones. During treatment session 5 and session 6, he still scored 3. In these sessions he managed to breathe deeper and he released the air pressure better than in the previous weeks. This was because Pilates helped him to reduce the tensions around the upper torso and shoulders, as Striny wrote that singers can carry and reach all pitch ranges while relaxed.¹⁴ Additionally, the previous study demonstrated that the Pilates-based exercises were mainly helpful in improving active respiration for speaking and singing, because the learner could improve physical flexibility and release the stiffness that usually occurred in other movements through breathing activity.¹⁵ Moreover, Brizick concluded that the Pilates method used in her singing classes mainly contributed to freeing the head and neck from being held rigid, and helping to reform the core muscles that provide strength and pliability.¹⁶

5.4 The Pilates Respiration-Based Classical Vocal Technique and tonal quality/interpretation

The participant demonstrated head resonance and interpretation poorly at the first baseline session. He progressed to score 3 at the last baseline session. In terms of breathing techniques, he had some difficulty breathing. As a result of this, he tried breathing deeply, but his breathing was audible, which caused tension in his upper chest and lifted his shoulders. Because of this, during his voice performance his voice became hoarse in the middle and higher registers. After a few performances though, he managed to understand the elements of the repertoire and became fully

¹⁴ Denes Striny, 23-24.

¹⁵ Joan Melton. "Pilates training and the actor/singer," accessed February 10, 2016, www.joanmelton.com/pilates-training-and-actorsinger.

¹⁶ Susan Brizick, "Pilates study and the affect on singing," accessed June 21, 2012, <http://healthyandconfidentsingingvoice.blogspot.com/2012/06/pilates-study-and-affect-on-singing.html>.

confident to breathe deeply and inaudibly. As a result, PRBC contributed to him being able to relax his torso and adapt trunk musculature to control his breathing, such that he could produce better head resonance. For the Pilates method, as Melton explained that Pilates breathing can be adapted for use in singing, contributing to the control of breathing and stability of movements that help sustain the quality of vocal tones.¹⁷

6. Conclusion

The Pilates Respiration-Based Classical Vocal Technique is a practical method that enhances classical voice performances of a participant. The participant learned the collaboration of the Pilates respiration and PRBC exercises in their classical singing. The stimulation covered the vocalization system that included sufficient breathing volume for singing skills. The importance of the breathing system led to improvement of the participant's physical and mental coordination. Often the participant lacked self-awareness during the singing preparation, especially the active respiration system, which included breathing by engaging lateral, intercostal, and the diaphragmatic system that provided musculature support.

7. Recommendation

This study did not include the case-comparative method, thus there was a limit to the age and number of participants, in order to find the percentages of improvement. In the future, the researcher may utilize more participants, by employing the experimental study to contribute an experimental group and a classified control group. Additionally, the researcher would identify the outcome and

¹⁷ Joan Melton. "Pilates training and the actor/singer," accessed February 10, 2016, www.joanmelton.com/pilates-training-and-actorsinger.

compare the progression between the two groups, in order to observe the pre-test and post-test scores of the target groups.

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