

Analyzing the Difference Between Experts and Non-experts in Ikebana

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ABSTRACT

Ikebana flower arrangement is a traditional cultural activity in Japan. It originates from the Buddhist tradition of flowers for the deceased and possesses a 1,500-year history. Ikebana skill has been handed down in the oral tradition from the master to the disciple, not in a systematic educational system. Also, the process of arranging flowers has not been evaluated quantitatively. Therefore, the object of the present study was to evaluate the process in Ikebana flower arrangement by extracting and examining the various operations, or steps. First, we divided four participants according to the number of years they have been practicing Ikebana, dividing them into expert and non-expert camps. The seated participants arranged three flowers and four materials using free-style Ikebana methods. The process was recorded by two video cameras (60fps). Using the obtained video images, we measured the frequency and time by classifying the operations involved in arranging flowers. We found that the process of flower arranging could be broken down into six operations; ‘Observing’, ‘Cutting’, ‘Bending’, ‘Coordinating’, ‘Inserting’, and ‘Modifying’. There were differences in the number of ‘Coordinating’ and ‘Modifying’ steps between experts and non-experts. The number of ‘Modifying’ steps for experts (15 times) was significantly less than that for non-experts (33 times). Also, there were differences in the time spent ‘Bending’, ‘Coordinating’, and ‘Modifying’ between experts and non-experts. The time spent ‘Bending’ for experts (93 seconds) was significantly shorter than that for non-experts (106 seconds). Second, we analyzed a Japanese high school contest for Ikebana flower arrangement. Seven teams of three students set to participate, and the process of Ikebana was recorded by two video cameras (60fps). As a result, it was possible to quantify the characteristics of the winning team. These results suggest the importance of the skill of ‘Bending’ and ‘Coordinating’ in the process of Ikebana flower arrangement.

Keywords: Classifying the operation, Expert and Non-expert, Coordinating, Modifying

INTRODUCTION

Research Background: Ikebana

Ikebana is a traditional form of Japanese culture with a history that spans more than 550 years. Although

quintessentially Japanese, Ikebana's appeal has become international in recent years. Much of the focus in Ikebana goes toward the finished product -- the flower arrangement -- but Ikebana is also a spiritual practice known as the "way of flowers" that sets it apart from the Western art of flower arrangement. The material used in Ikebana is not limited to bright and colorful flowers. Ikebana differs from Western flower arrangement in that a tapering stem, a branch, leaves and moss are all Ikebana material.

Ikenobo is one of several schools of Ikebana. Within Ikenobo, the three main styles of Ikebana are Rikka, Shoka and Jiyuka. Ikebana done in Rikka style refers to a stand-alone piece that traditionally depicted a scene from nature and graced large rooms of samurai households or the Imperial Court. Ikenobo's leading style of Ikebana, Rikka has been handed down through the years. The Shoka style also refers to a specific structure or shape of Ikebana, which was spread by the townspeople during the Edo period. Jiyuka style, unlike Rikka and Shoka, is free from restrictions; the branches don't have to fulfill any requirements, which means the arranger can create a piece according to the colors, shapes and characteristics of the leaves.

Of these three styles, Rikka calls for a complicated structure and has been deemed difficult for beginners. The Jiyuka style, lacking stereotomy, is influenced heavily by the arranger's personal values and sense of aesthetics. Compared to the two styles, Seika is judged according to clear standards. Shoka (as seen in Figure 1) is structured with three principal stems: the Shin, Soe and Tai (symbolized Heaven, Man and Earth). The Shin stem is generally 2.5 to 3.5 times the height of the container, the Soe stem is two-thirds the height of the Shin, and the Tai is about one-third the height of the Shin. It is essential that the three stems of Shin, Soe and Tai achieve textural and tonal variety in addition to the above-mentioned proportion -- the 7:5:3 ratio. Each Shin, Soe and Tai is required to face a certain direction, and the total number of stems in the container must be an odd number.

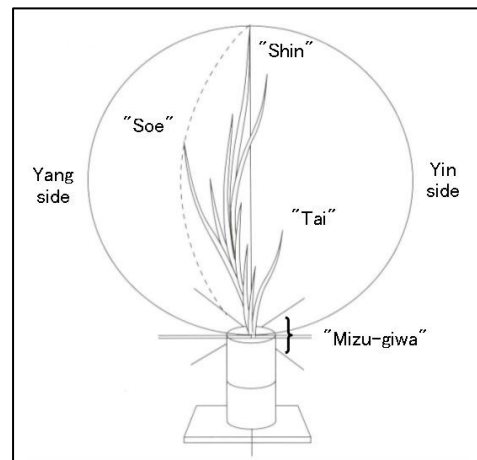


Figure 1. Model of Shoka style

Identifying the Problem

Ikebana involves organic material that changes every day and with a limited lifespan. The tradition has endured to this day, evolving into several different styles through the years, thanks to a system where knowledge is handed down from master to apprentice. Ikebana is considered a spiritual practice for its focus on the process rather than the finished product.

However, many Ikebana instructors apply personal teaching methods extracted from their experiences and sensibilities. They are not necessarily taking a rational or systematic approach to their instruction and the style they teach. Also, Ikebana has several different schools, each with its own set of styles and approaches that defy a one-size-fits-all method to arranging flowers. Because of this, there is very little that looks at the act of Ikebana from a scientific standpoint, which complicates attempts at objectively evaluating the skill of arranging flowers. And, as far as scientific research is concerned, the study of Ikebana has made progress in some historical and aesthetic fields,

but has made next to nothing in the areas of natural science and scholarly inquiry. To this day, teaching Ikebana has relied on the traditional idea of "watching and learning," or "staying attuned to what the instructor is doing". This limits Ikebana from spreading internationally to people with diverse languages and cultural backgrounds. There is a critical need for science to step in and bring some objectivity into the instruction and evaluation of Ikebana skills.

Purpose of Research

In recent years, the field of sports has embraced the concept of a fixed model as the most practical, efficient and even aesthetically pleasing way to acquire skills. The same can be said about Ikebana. The entire Ikebana process, from start to finish, needs to be systematized by identifying each task and recording the length of time it takes to complete them. One must also take into consideration the various experience levels of the practitioners and how that influences their work. The goal of this study is to observe Ikebana by videotaping the process, organizing that process by tasks, then consider the effect a practitioner's experience has on the tasks themselves and how often those tasks are repeated.

We believe that bringing clarity to the process will help teachers with their instruction. Showing the connection between the various tasks and the end product may help instill a sense of awareness in the process of arranging flowers. This also allows the Ikebana student to visualize the finished product at an early stage -- an effective tool in raising one's skill level. In the future, intervention studies of Ikebana's technical instruction will potentially help teachers clarify important points of their instruction. This study is significant in that it develops technical evaluation and instruction methods to the internationally established art form of Ikebana.

METHODS

Research Subjects

There are four subjects in this study: two men, two women. They are all veterans at Ikenobo. Table 1 shows the subjects' gender, age and years of experience. The subjects gave their informed consent and were briefed on the nature of the experiment and its procedures.

Table 1: Participants of experiment

Subject ID	Gender	Age	Years of experience
ID1	Female	27	2
ID2	Male	31	4
ID3	Female	42	21
ID4	Male	72	63

Research Environment and Methods

The research took place in a conference room 5 meters wide and 15 meters deep. The sunny room with white walls faced south. In the conference room, each subject was asked to create an arrangement in the Shoka style. After the completion of each arrangement, the final product was removed to another space so that the subjects wouldn't be able to view the work of others and be influenced by them (Figure 2).

The materials provided for the Ikebana were 4-6 stems of the standard pussy willow and 2-4 stems of the small chrysanthemum. The subjects used the same receptacle, which was a 30-centimeter tall ceramic flower vase with a level mouth. The pliable pussy willow, which can be bent to almost any desired shape, was deemed perfect for the study in demonstrating the subject's level of expertise. Shoka style arrangements call for an odd number of stems,

but the subjects were allowed the choice within those limitations of how many pussy willows or small chrysanthemums to use. They were also allowed unlimited time to create their ikebana arrangements.



Figure 2. The scene of the create an arrangement in the Shoka

Processing Data

The subjects were recorded on two digital video cameras (Panasonic HDC-TM25) at 60fps. The video cameras were set up in the front and off-center to the left to get a full view of the subject's body and hands. For this study, we established that one task consists of a series of movements to complete one specific goal within the entire Ikebana process. We later used the footage to record the tasks along a time axis. The time it took to complete each task was recorded in units of 1/59.94th of a second. Each task was measured by how much time it took to complete it, and how many times it was repeated throughout the process. Repetitions per task by material and time spent per task were calculated to arrive at a central value for each subject.

RESULTS

Table 2 shows the experiment's findings: the length of time it took to complete the Ikebana, the number of tasks involved and how long each task took to complete. Omitted from the study's data was the time the subjects took to spread out the material on the table, and clean up because they are not essential aspects of Ikebana.

The total number of tasks required to complete all four ikebana was 464. The average time it took for all four of the subjects to complete the ikebana was $1,267.0 \pm 326.5$ seconds, and the average value of the number of tasks done was 116.0 ± 28.1 times. The time dedicated to the completion of each task came out to an average of 11.2 ± 2.8 seconds.

Table 2. Date of time, number of tasks to complete

Subject ID	Number of materials		Time spent per task	Task frequency	Time per task
	Pussy willow	Small chrysanthemum			
	Number of flowers	Number of flowers	Seconds	Frequency	Frequency/Second
ID1	4	3	1139	153	7.4
ID2	6	3	1741	122	14.3
ID3	4	5	997	90	11.1
ID4	6	3	1191	99	12.0
Total			5068	464	

Work Categories

In organizing the content of each task, we were able to group them largely into main and supporting tasks. The main tasks refer to three activities that require the subjects to directly handle the flowers: Cutting, Bending, and Inserting. Cutting refers to cutting the stems to their appropriate lengths. Bending the stems into a desired shape creates a certain atmosphere to the flower arrangement. Inserting refers to inserting the flowers into the pin holder

Supporting tasks refer to the adjustments that take place before or after the main tasks: Observing, Coordinating, Modifying. Observing refers to looking at the material, deciding the length of each stem as it relates to the others, then observing again before moving on to the next set of tasks. Coordinating looks at the overall balance of the composition, and making length or volume adjustments where necessary. This doesn't include the work of inserting the flowers into the pin holder -- coordinating refers to the adjustments the subjects make while comparing the stems against each other. Modifying refers to a set of actions after the flowers have been inserted. It includes the finishing touches to the ikebana: observing the end product, and making final adjustments to the angle of the inserted branches.

Number of Tasks and Task Hours per Ikebana

Figure 3 shows the relationship between the number of years of the subjects' experience with the number of times each of the six specific task was repeated. In the main category, Inserting was fairly uniform across the four subjects, but the frequency of Cutting and Bending decreased with experience, but was particularly noticeable in Bending.

Figure 4 indicates the relationship between years of experience and the total amount of time spent on each of the tasks. In the main task areas, Inserting was steady across the board, regardless of experience. But Cutting and Bending showed variation according to years of experience. Those with more experience spent more time Cutting. With Bending, however, the trend was less straightforward. Bending time increased with experience at a certain point, then it began to trend lower. In the supporting tasks, the time spent Observing remained stable regardless of experience. Coordinating and Modifying decreased in time with more years of experience.

Figure 5 shows the relationship between the number of years of experience and the amount of time the subjects spent on the task every time they performed it. In the main task category, the time spent Inserting held steady for all subjects. The amount of time spent Cutting increased with years of experience, while that of Bending increased briefly with experience, then trended lower. With regards to supporting tasks, experience had little influence on the amount of time spent per task.

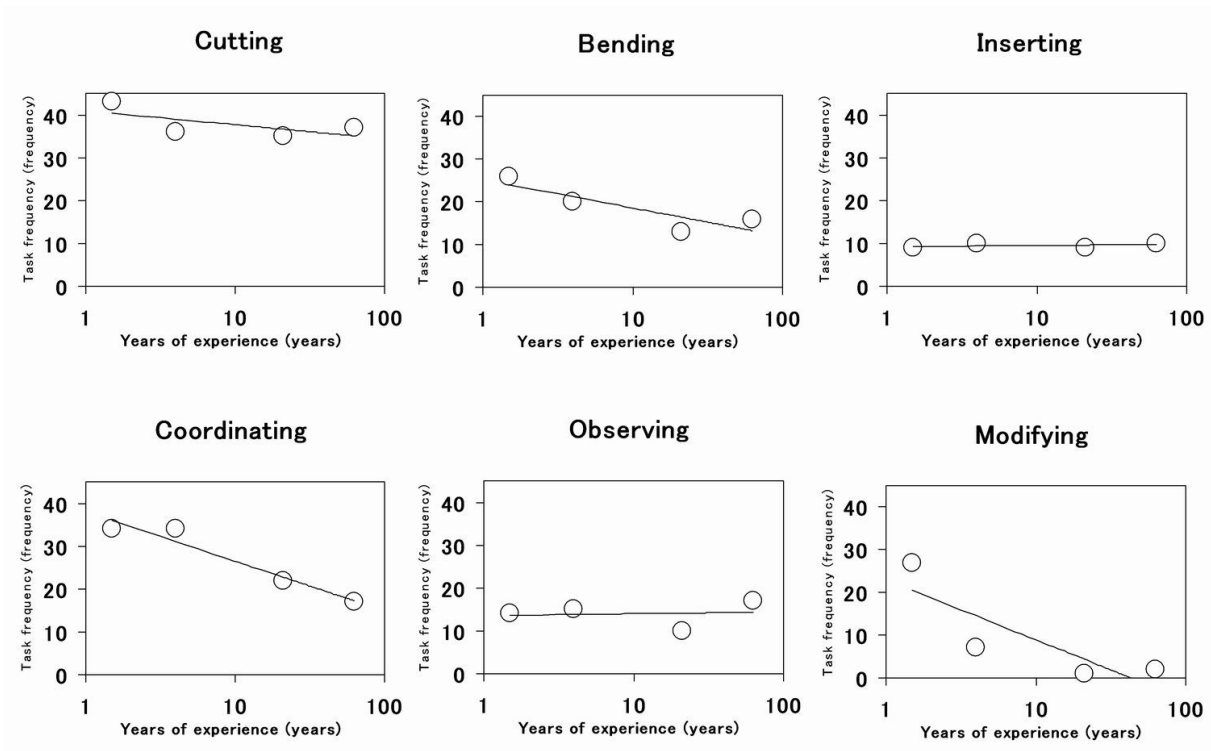


Figure 3. Relationship between Task Frequency and Years of Experience

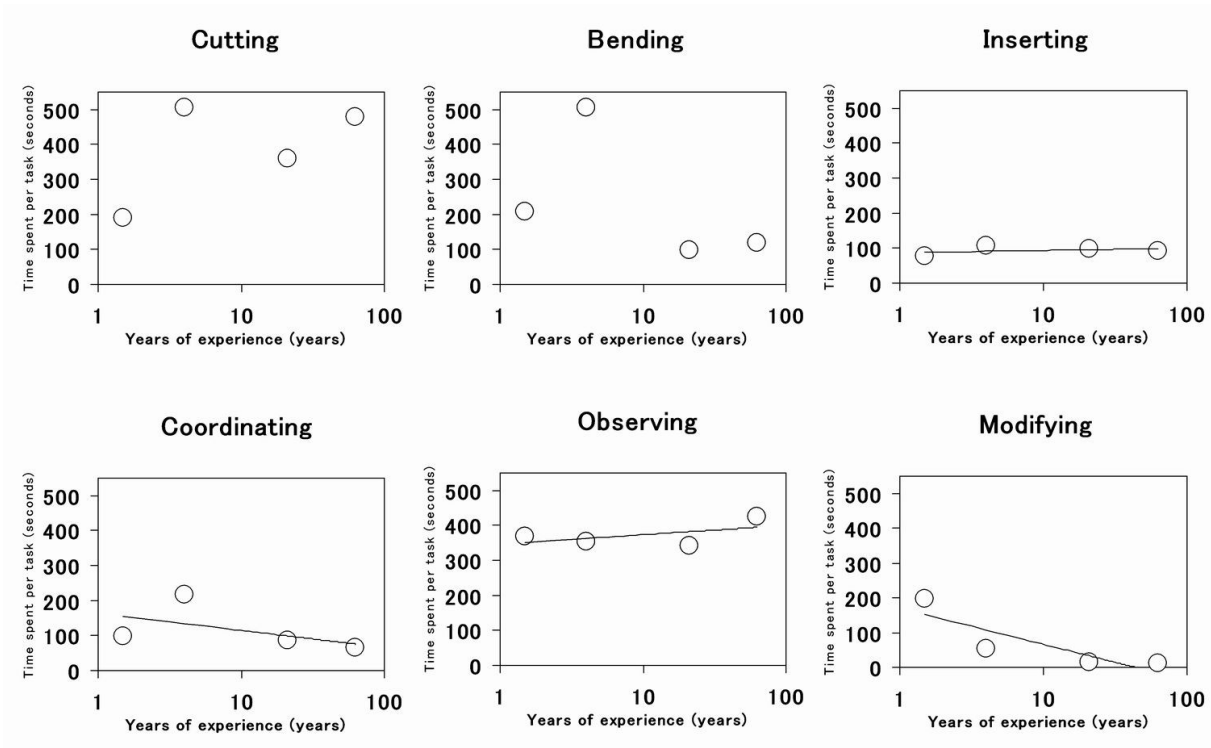


Figure 4. Relationship between Time Spent per Task and Years of Experience

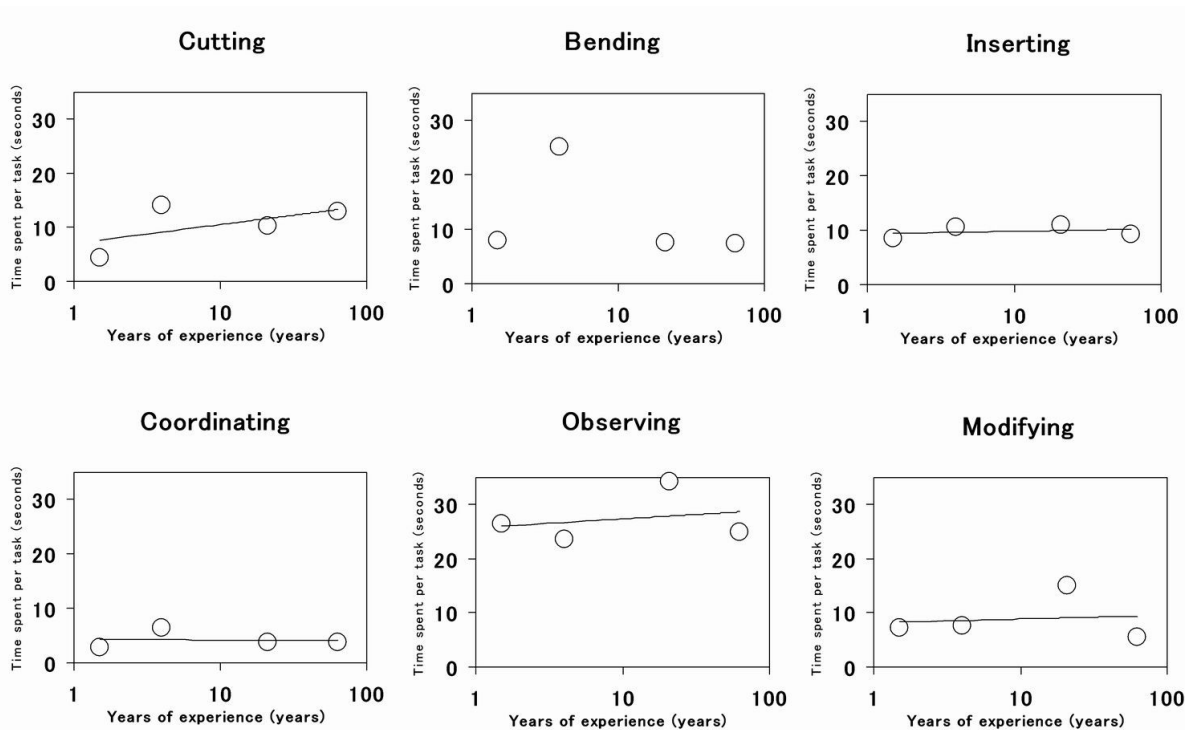


Figure 5. Relationship between Time Spent per Task and Years of Experience

Task Hours and Task Frequency per Stem, by Material

We will consider task frequency and task content by material. Figure 6 looks at the relationship between years of experience and the average task frequency per material. In the main task category, the task of Inserting remained steady per stem for all subjects, regardless of years of experience. Subjects with more years of experience tended to engage in less Cutting of both types of material, although the pussy willow was handled with far less frequency than the small chrysanthemum. The task of Bending was seen only in the pussy willow and with less frequency as the subject’s experience level increased. With the supporting tasks, there was no difference with either stems. When combined, the task of Modifying happened less frequently the more experience the subject had.

Figure 7 looks at the correlation per flower between experience and the average amount of time spent per stem. In the main task area, the frequency with which a stem of pussy willow was cut and inserted remained more or less unchanged regardless of experience. But with the small chrysanthemum, the frequency tended to drop with experience. The two subjects with fewer years of experience spent 60 seconds Bending the pussy willow, whereas the other two with more experience spent 20 seconds -- a marked difference. With the supporting tasks, very little variation was found in terms of material, but when combined, the frequency of Modifying decreased with more years of experience.

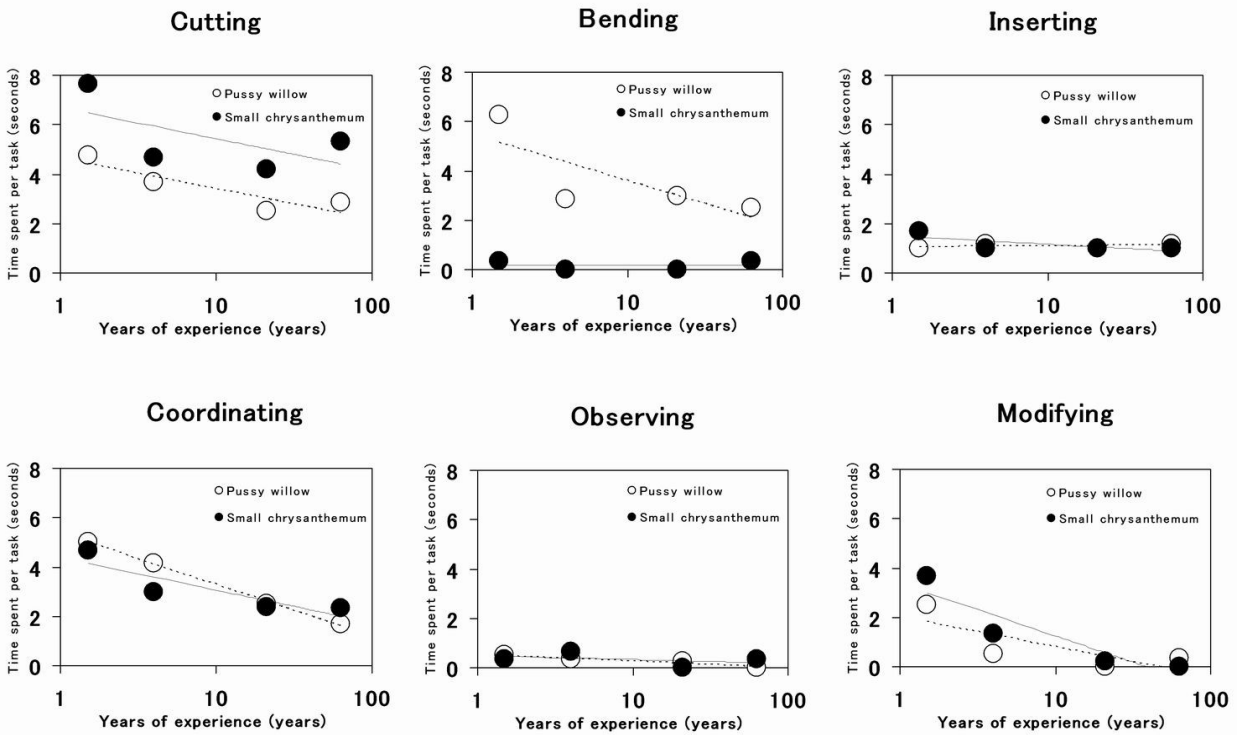


Figure 6. Relationship between Task Frequency per Material and Years of Experience

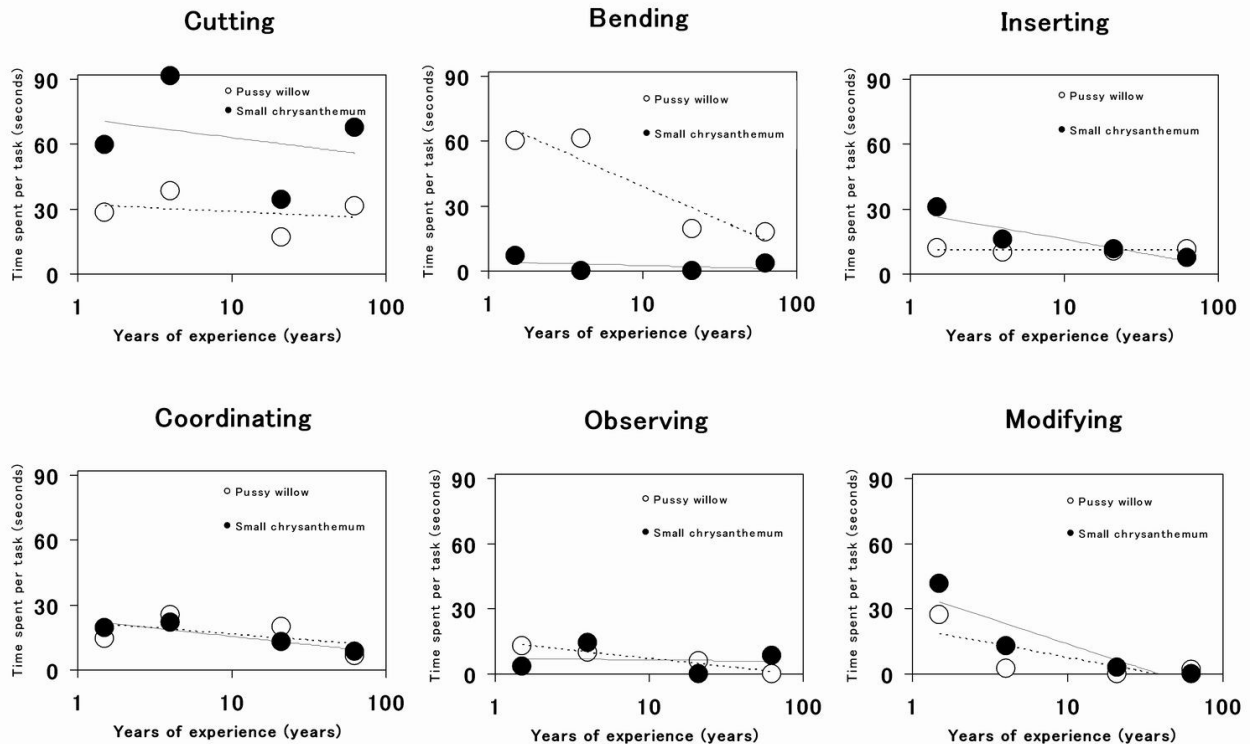


Figure 7. Relationship between Time Spent per Task by Material and Years of Experience

DISCUSSION

Task Categories

After studying the production process of the four subjects, it became clear that the process is made up of six types of tasks. They comprised two categories: three main activities that involve actual handling of the stems (Cutting, Bending and Inserting), and three supporting activities that take place before and after the main tasks (Observing, Coordinating, Modifying). In order to complete one Ikebana arrangement, one must complete these two varying sets of tasks -- or a total of six tasks. Typically, these activities take place rather randomly throughout the entire production process, but the tasks themselves are unique.

Task Frequency

Considered the most crucial, the tasks of Cutting and Inserting have traditionally been the primary focus of Ikebana. However, from the standpoint of time and frequency of those tasks, the study showed little difference according to level of experience among the four subjects. On the other hand, Bending and Coordinating, which were not considered central to Ikebana, turned out to carry deeper meaning that only experience can begin to grasp. Greater awareness on and improving upon the tasks of Bending and Coordinating throughout the production process hold the key to honing one's Ikebana skills.

Also, we have found that subjects tended to cut the small chrysanthemum more frequently than they did the pussy willow. The chrysanthemum's flowers, blossoms and leaves are more concentrated, and are more laborious to treat than the comparatively bare pussy willow. We feel that this contributed to the differences in Cutting frequency. In future studies, we will have to consider the characteristics of the material we provide.

Time Spent Per Task

Time spent per task for /Inserting and Cutting was virtually the same regardless of experience. These tasks are simple one-off activities and are not influenced by experience. On the other hand, Modifying was a task that diminished in time with experience. This can be explained by increased dexterity.

Coordinating and Bending were tasks that spiked with more experience, but then trended lower after a certain point. This is most likely due to the fact that beginners usually insert the flowers without much thought, whereas those with more experience think about positioning and are more mindful about inserting the flowers. Bending is a task that requires consideration and skill -- from evaluating the stem's flexibility, then applying the right amount of pressure to bend it. Data shows a clear difference in the amount of time those with experience and those without spent on those tasks. The results suggest that the more experience the subject has, the deeper the appreciation for the complexity of Coordinating and Bending.

From the standpoint of Ikebana instruction, beginners tend to perform more tasks but spend less time on each, which translates into more wasted actions. From this, Ikebana teachers can incorporate efficiency into their instruction.

CONCLUSIONS

The work of Ikebana is composed of the main tasks of Cutting, Bending, Inserting and the supporting tasks of Observing, Coordinating and Modifying. The study revealed that Bending and Coordinating, which were not considered central to Ikebana, were in fact closely associated with experience.

Bending and Coordinating were tasks that subjects spent more time performing as their levels of experience increased. But after a certain amount of time, the subjects spent less time. This indicates that the two tasks are appreciated for their complexity by those with experience.

In the future, teaching methods can incorporate putting more care into the tasks of Bending and Coordinating, and helping beginners reduce wasteful motions and work efficiently.

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