Massed vs. Distributed Practice

“The less meaningful the task the greater the superiority of distributed practice over massed practice. Boredom can be minimised and learning facilitated if there are frequent short breaks in practice.” Jim Hagart (2000)

The terms massed practice and distributed practice often have been used by research on practice-distribution effects especially in learning motor skills. Lee and Genovese (1988), conducting a thorough review of the literature pointed out that the terms were operationally defined in terms of rest during inter-trial interval. Singer (1980: 419) defined massed practice narrowly as practice “without any intermittent pauses.” Schmidt (1982, 1991, and 1991) provided wider definition of “massing” as it means “running work periods very close together with either no rest at all or very short rest intervals in between. By default, distributing practice means spacing these intervals of work apart with longer periods of rest” (1999: 293).

Tasks used in the distribution of practice research cover a very wide range (motor to verbal task) as Lee and Genovese mentioned (1988). However, the literature I came across was all concentrating on motor skills which seem to dominate the literature of massed and distributed practice. Although it appears to be more associated with movements, one may be able to draw some implications for language learning tasks.

Effect of distribution on performance and learning

Many experiments were done in the 1940s to 1960s on practice distribution effect (see Lee and Genovese, 1988). Although these studies differ in methods, the results seem to be similar (Schmidt, 1991). Conducting a meta-analysis including 116 studies on motor skills, Lee and Genovese concluded, “the advantage of distributed over massed practice on performance at the end of practice is constantly large over experiments” (1988: 288). They also, suggested that distributed practice conditions resulted in better learning than massed practice conditions.

A typical example of the distribution of practice effect on performance and learning is the study conducted by Bourne and Archer (1956). In this study, five different groups of participants were compared. All groups had work periods of 30 seconds. In one group, they practised continuously for 21 trials (0-s rest group). For the other groups, each group had a different rest interval between work periods. One group had rest periods of 15 seconds, and the other three groups had rest periods of 30, 45, or 60 seconds. Bourne and Archer’s findings were very clear: the longer the rest period, the better the performance (Lee and Genovese, 1988; Schmidt, 1991).

To assess distribution effect on learning, Bourne and Archer gave all of their participants a 5 minutes rest period following the last trial. After the rest period, participants were asked to perform the task under a massed condition (all trials were performed with 0-s rest periods of 30s of work. The results showed that groups that had initially practised with some rest between trials still performed better than the group that had practised with no rest. The finding suggests that precise distribution had a relatively permanent effect, which is supported by the literature (see, Lee and Genovese, 1988; Schmidt, 1991).
However, most of massed and distributed practice research had involved ‘continuous’ skills analogous to real-world tasks such as swimming or cycling and termed ‘continuous’ tasks. Schmidt (1991) pointed out that the principles governing the effects of massed and distributed practice are different for ‘discrete’ and ‘continuous’ tasks.

“By far most of the massed practice experiments involved periods of continuous tasks, but very few had discrete tasks as in a throw or a kick which can be performed in few tenths of a second” as Schmidt stated (1991: 192). Because of the trial periods are very short, it is difficult to make the rest periods short enough to affect performance (Lee and Genovese, 1988; Schmidt, 1991). Findings from studies conducted using discrete tasks show that there has been either no decrement in performance or learning or perhaps even slight advantages for massed conditions (Carron, 1967; Lee and Genovese, 1988). However, the distribution of practice effect on performance and learning involving discrete tasks is yet to be enough investigated. Schmidt (1999) pointed out that much of the research was conducted in the 1940s and 1950s, and with few exceptions, investigation in this issue has stopped (1999: 298).

One factor that affects this clear advantage of distributed practice over massed practice is muscles’ fatigue. Fatigue is probably the cause of massed practice depressing and degrading performance and learning. Because of limited duration of trial time (tenths of a second), this factor may not appear in practising discrete tasks which leaded to this different findings.

Brain fatigue by losing attention may occur as a result of massing especially in a cognitive task. If one practice under mass condition, his or her capacity to discriminate attention will be weaken and focus will fade out. As a result, the effect of practice on learning will be lost and proper learning may not occur.

However, I suggest that tasks under massed practice may increase performance at the early trials but without solid advantage for learning. Studying for exams might be a good example for distribution of practice effects on performance and learning.

When a student only masses his study sessions immediately prior to each exam, this may result to temporal success, which may be washed out after finishing the examinations period. Whereas, if the student distribute his study effort throughout the course, this may result in better performance and permanent effect on learning. Student may need some patience and persistence to follow the distribution schedule though. This analogy may not be applicable directly to language learning tasks, but I think it worth being investigated.

Baddeley (1999) provides more evidence about the superiority of distributed practice effect on learning over massed practice. He points out that it is better to distribute learning trials across a period of time than to mass them in a single period. In a study conducted to teach a large number of postmen to type, he grouped them into four different practice schedules: an intensive group with two two-hour sessions per day, intermediate groups involve either one two-hour or two one-hour sessions per day, and more relaxing group which involves one one-hour session of typing per day.

The results show that the group who worked for one-hour a day learned the keyboard on fewer hour of training and improved their performance more rapidly than the other three groups. He (1999: 75) indicated that they
learned in 55 hours as much as the four-hours per day group learned in 80 hours. They appeared to continue to improve at a faster rate. When tested after several months, the one-hour per day group retained their skill better than the four-hours per day group. These results show that distributed practice is more efficient and better for learning.

However, returning back to Hagart (2000) statement, One can see that there is another factor that disadvantages massed practice namely boredom which causes de-motivation. Hagart statement is based on experience as he mentioned. It lacks literature support, but it seems very interesting to be investigated to find out the distribution of practice effects on performance, learning and motivation.

Distributed practice condition appears to be more superior to massed practice. The question that one may pose is how distributed the practice should be. What is the best time gap? Schmitt & Schmitt (1995) suggests the ‘principle of expanding rehearsal’ technique invented by Landauer and Bjork (1978, cited in Baddeley, 1999). This principle suggests that the sooner an item is reviewed the greater the probability that it will be correctly recalled, and then to gradually extend the practice interval. The longer the interval one can go the better the chances that the item be recalled (see, Baddeley, 1999: 75). This may be one method of distributed practice which has been tested in learning new words and worked well as Baddeley indicated (1999: 76).

Finally, from the survey above, we found that task type, distribution of practice and motivation are linked factors which need to be balanced in order to achieve better results. In addition, The distribution of practice effects has important implication for the design and sequence of language syllabuses. However, research on language learning tasks needs to be conducted to find out the effects of task distribution effects on performance, learning, and motivation as well. To summarise this issue, I would like to quote this prophetic tradition from Prophet Mohammed (Peace be upon him) sayings (14 centuries ago) “Little and often is better than Numerous but discontinued” (my translation).