Distribution of Skills in Siliar

Essentially, anything that can be done in the world can be considered a skill. From magic, to combat, to basket weaving, to cooking – all can be considered skills. The proficiency to which something can be done is a factor of several things. For the sake of this discussion, we will call the potential for doing something the *Skill.*

Therefore, *Skill* is a function of raw, innate genetic *Ability*, the sum of experiences and cognitive understanding that will be hereafter referred to as *Training*, and the further contribution of other physical and mental characteristics that will be called *Power*.

$Skill = f\,Ability \bullet Training \bullet Power$

To further understand the idea of *Power*, consider the example of chopping wood. Assuming two people are equal in *Ability* and *Training*. One that has more physical strength would be better at chopping wood. Some amount of eye-hand coordination is also desirable. Thus, for chopping wood, *Power* is a function of strength and eye-hand coordination. (Other characteristics could also be considered as part of power.)

For any *Skill*, a definition of *Power* can be contrived. For singing, it would differ from chopping wood or doing magic. Nevertheless, each *Skill* can be associated with some *Power* characteristic.

Looking more closely at the *Skill* function, each part can be discussed independently.

Beginning with *Power*, since it is always dependent on some characteristics of the individuals, and since such characteristics are related to genetics, it can be assumed without risk that *Power* is distributed normally for any *Skill.* For the sake of the model, *Power* can be assumed to be a multiplier with an average of 1 (one). Since it is normally distributed, there are equally individuals with .5 and 2, or .25 and 4. For any *Skill*, the standard deviation of *Power* is independent, but in all cases, a mean of 1 (one) can be assumed.

Training can be assumed to also be a multiplier ranging from 0 (zero) to 1 (one). It can be conceptualized as the percent of possible information learned (via instruction, trial and error, or discover). As such, average degrees of *Training* are highly dependent on cultural practices. For example, far more people have higher *Training* in skills such as clothes making than in skills such as drawing with oil paints.

Ability also can be considered to be normally distributed. However, the observation of individuals with extremely low abilities is rare. Simply because it is not practical for a person with near zero *Ability* to perform a task when there are so many other tasks that he or she can do better. However, significant interest is found from examination of the distribution of *Ability* on the high end of the distribution.

Up to this point, there has been no discussion of a unit on *Skill*. Though never mentioned in the books, a convenient handle by which to describe *Skill* is Level. Thus, *Ability* can be considered the raw potential to achieve a certain *Skill* Level, or simply *Skill*.

Ability can be assumed to be normally distributed around a mean of 5 (five). Ten out of ten people will have an *Ability* of greater than zero. One out of ten will have greater than 10. One out of 100 will exceed 15. One out of 1000 will exceed 20. One out of 10,000 will exceed 25. One out of 100,000 will exceed 30. One out of 1,000,000 will exceed 35. One out of 10,000,000 will exceed 40. One out of 100,000,000 will exceed 45. One out of 1,000,000,000 will exceed 50. Each five measures of *Ability* higher are 1/10th as likely.

At last, we come to the application of *Skill*. *Skills* are used to accomplish something.

Using the *Skill* function:

$$Skill = f\,Ability \bullet Training \bullet Power$$

a Level for *Skill* can be determined from the other individual characteristics. *Skills* can be compared to one another as simple ratios. Thus, a *Skill* of 10 is 2 times as high as a *Skill* of 5. A *Skill* of 25 is 1.25 times as high as a *Skill* of 20.

At this point, the idea of Outcome will be introduced. Outcome will be defined as the result of using a *Skill*. Therefore, the potential for Outcome will be defined as:

$$Outcome_p = Skill \bullet \Delta_{ran} \bullet Effort$$

where Δ_{ran} is the random chance for variance[1] and *Effort* is some function time and energy spent – exertion.

For example, the $Outcome_p$ of a less skilled blacksmith can be the same as one of higher skill if double the time is spent on the same task. Likewise, a warrior doing battle with physical exertions equal to a sprint would enjoy more success than if s/he fought with exertion equal to a jog.

Not all task are subject to the application of extra time. Jumping and touching the ceiling is one example. Expending extra time has no meaning in such a case. Likewise, some situations are unaffected by expenditure of additional exertion. Painting and sketching can represent such tasks.

For any given task, there is a certain required Outcome Demand, $Outcome_d$. This can be thought of as a threshold of performance demanded for a favorable Outcome.

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[1] It should also be noted that Outcome can be affected by Devine intervention. There is no mathematical model for this.

Thus, when $Outcome_p > Outcome_d$ the results can be assumed to have been those sought by the individual.

In many cases of person versus environment, the Outcome Demand is fairly low. As an example, assume that making a horseshoe demands $Outcome_p$ of greater than 3. A smith with *Skill* in the 10 to 20 range will rarely have any trouble making such a device. His or her extra skill will simply be excess, allowing him or her to daydream about supper while hammering away. Conversely, a smith with only a *Skill* of 3 will be required to focus attention and effort in hopes to keep Δ_{ran} at or greater than 1.

In cases of person versus person – such as combat – the threshold one person must exceed is the $Outcome_p$ of the other person. The role of Δ_{ran} in such a case becomes extremely important, particularly if the two individuals are nearly equal in *Skill*.

EXAMPLE: Two Warriors

Warrior number one has innate *Ability* to which we will ascribe the number 20. He has been trained as a soldier, so his *Training* can be said to be .5. However, he is a large man with great strength, so his *Power* is 1.5. As a result, he has a *Skill* of 15.

Warrior number two is a lady also with *Ability* of 20. She has average strength for a woman, but exceptional gross motor coordination, agility, and quickness earning her a *Power* of 1. She has made a long study of sword combat and has *Training* that is .75. As a result, she too has a *Skill* of 15.

The two enter battle and the outcome, since both are equally matched, will depend on random variance.

EXAMPLE: Picking the Lock

A master locksmith with a *Skill* of 25 crafted a lock. A thief with lock picking *Ability* of 5, *Training* of .2, and *Power* (fine motor skills, sense of touch, eye sight, hearing) of 1 attempts to pick it. The thief has a *Skill* of 1.

In this case, the chance of success is VERY slim, dependent almost entirely on random variance – luck.

Application of the Skill Concept to Combat

Because society in Siliar commonly fell into war, combat *Skill* was a matter of gave importance. Since nothing can be done to change *Ability*, most realms relied on selecting the best candidates, providing them with significant training, and helping them to develop desirable physical traits as a means to improve the aggregate *Skill* of their armies.

As a result, from a population of 2000 people, a group of 50 soldiers could have been kept in arms consisting of all individuals with *Ability* between 10 and 15. (200 people

with *Ability* over 10 could have been identified.) With some luck, they would have 1 with *Ability* between 15 and 20. These soldiers would be trained extensively to between .5 and .75 *Training*. Almost to a soldier, they would be conditioned to increase their *Power* to between 1.25 and 1.5.

As a result, the 50 soldiers would range in *Skill* between 6.25 and 16.875.

In comparison, the typical person of the realm would have an *Ability* of 5, *Power* of 1, and *Training* between .25 and .5. The resulting *Skill* range of average citizens would be 1.25 to 2.5.

Thus, the best average citizen would be 2/5 as good as the worst soldier.

In realms with 20,000, on average, 200 people could be found with *Ability* over 15 and 20 found with *Ability* over 20. Statistically, 2 would be found with *Ability* over 25 as well.