

BDO: Accuracy Explained (v3)

DISCLAIMER

This is the third of a series of documents that I made on the subject of Accuracy in Black Desert Online.

For those who are not familiar with my approach on this matter, my conclusions are drawn after collecting data through **empirical** tests - whose settings are determined **logically** -, and after analyzing the results of said tests **logically**.

As before, all the results shown in this document are subjected to RNG: it is possible for

an attack with a 99% hit chance to miss 100 times out of 100, and it is also possible for an attack with a 1% hit chance to hit 100 times out of 100. I will be conducting a statistical analysis of the empirical data I gathered: **you can argue about my conclusions, but please refrain from doing so if you did not read (and understand) this document fully.**

Also, **do not** question the data: if you keep on reading, you **accept** that the data I reported are the data I gathered under the circumstances specified in the “Environment” section - that is, you accept that I am **not** lying about the data.

If you don't want to read this document in its entirety, you can just go read the [TL;DR](#).

USEFUL LINKS

“un-Official Accuracy” thread: [Forum Link](#)

First Document (mostly outdated): [Reddit's post](#) - [Document Link](#)

Second Document: [Reddit's post](#) - [Document Link](#)

Third Document (this one): [Reddit's post](#)

Serendia Special bugged: [Reddit's post](#) - [Forum Link](#)

AP vs Human Damage: [Forum Link](#)

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INTRODUCTION

First of all, I would like to give you all a big “thank you”. When I started doing my tests I could never think that my work would become so popular. After I posted my second document, I suddenly received a lot of messages from thankful people; some of these were even willing to help me do some future testings. Your support was what fueled me to keep on doing this kind of stuff, as the game itself wasn’t really entertaining me as much as I liked. I was basically just playing for the only purpose of trying to understand better how BDO’s system worked, so that I could share it with you.

In addition, I would also like to point out that I was not alone in this journey. Granted, I was the one doing the tests (alongside my testing partners), and I was the one writing these documents. However, it is important to note that the reasoning behind most of the tests was usually the work of some “random” users from the internet. For example, **before** my last document, I never could have thought that the Armor Enhancement level affected evasion (this idea was brought up by the user “Evid” on the BDO’s forums). At the same time, **after** publishing it, it was thanks to the user “Degaussed” (and to all the others who joined the discussion) that I was made aware of the possibility of DP being the result of two different stats. Unfortunately, my extremely limited free time prohibited me from conducting thorough tests on this matter, but I ultimately think that this is indeed how the system works. I can’t *prove* it, but there are a lot of hints about this; plus, it would be coherent with all my tests.

This is all for showing you that, despite me being the one writing about it, I really felt as if all the knowledge we “have” now is the work of (a good part of) the entire community. Thank you, again, really.

In any case, let us get down to business. I already hinted that I was not able to test how the theory about DP being split into two parts. However, be ensured that what you will find here is still very interesting. Some of those who actively follow me on the BDO’s forums may already know most of the things written here.

To sum it up, this is what this document will talk about:

- Kzarka vs Liverto (Accuracy-wise)
- Liverto vs Yuria (Accuracy-wise)
- Serendia Special not working (I have already made a Reddit’s post about this, but it never hurts to talk about this again)
- Skill facts
- Class similarities
- Ultimate Armor vs non-Ultimate Armor

As my time is really limited, I will be more concise in my explanations - some of them will be straight up copy-pasted from my old posts in the Forums.

DISCLAIMER: all the equipment mentioned below is at +15. All the offhands are blue quality. The Yuria bow is Green quality.

Kzarka vs Liverto

Environment

Lv55 Ranger->Lv55 Ranger. The attacker was not equipping anything else aside from the Liverto weapon. The defender was wearing a full +15 (blue) Grunil Armor. The "+3 Base Accuracy" was from the guild buff.

Results

#	Weapon	Attack	Hits	Misses	Hit Rate	Miss Rate	Sample Size		
I	Liverto	BowMastery I	309	91	77.2%	22.8%	400		+3 Base Accuracy
II	Kzarka	BowMastery I	328	72	82%	18%	400		
III	Liverto	RoundKick I	322	78	80.5%	19.5%	400		
IV	Kzarka	RoundKick I	339	61	84.8%	15.2%	400		

Table1

Comments

The difference is indeed small. So small that some of you might claim that it's RNG - which would be a reasonable statement.

In order to verify if the two weapons do indeed provide the same amount of Accuracy, we need to resort to a proper "2 sample Z test". For those of you not familiar with this term, let me sum it up like this: "it's a test to verify how likely it is for two samples to be equal". You can find out more about this if you just type in "Z test" in Google.

By computing these tests "alone" - that is, by comparing (I with II) and (III with IV) - we would get:

-Using Bow Mastery I: 90% Chance that Kzarka is more Accurate than Liverto

-Using Round Kick I: 88% Chance that Kzarka is more Accurate than Liverto

A confidence interval of around 90% is decent, but not big enough to *statistically* prove that the two samples are equal. This is why I had to resort to a "trick" (and, for this, I thank the user Fire Spin, who provided me with additional data from his tests): I basically pooled together all the results so that I could compute a z-test with a bigger "sample". The results came from different "environments", so we can't use this to determine *how much* the two samples differ. However, we **can** use this to determine whether they *do or do not* differ. Think of it like this: "if the two weapons provide the same Accuracy bonus, then, under the *same* circumstances, they should behave in the same way (ie: show similar hit rates)".

As I said, I not only used my results for this, but I also added in the results from the tests of this Fire Spin user, which reported the following:

-kzarka hit 242/310, 78%

-Liverto hit 222/310, 71.6%

We don't need the conditions of his tests: what's important for us is that he performed the Kzarka **and** the Liverto test in the same environment.

(you can find out more about his tests in [this post](#))

So, basically, our Z-test would be comparing two samples:

-Kzarka sample: 909 hits (on 1110 attacks: 400 w/ RoundKick, 400 w/ auto, 310 from FireSpin)

-Liverto sample: 846 hits (on 1110 attacks: 400 w/ RoundKick, 400 w/ auto, 310 from FireSpin)

The computation was performed [here](#).

Conclusion

The significance level of 0.01 is statistically enough to claim that Kzarka and Liverto **do not** provide the same Accuracy bonus (with Kzarka being more accurate).

Granted, the difference is not *that* big, but it's there. If you're aiming for the BiS weapon, you should definitely get a Kzarka. Otherwise, sticking with your Liverto will not affect you all that much.

Liverto vs Yuria

Environment

Lv55 Ranger -> Lv55 Ranger. The attacker was using just the weapons, with his only accessory being a Kalis Ring for the +2 Accuracy. The defender was wearing a full+15 Ultimate Grunil armor.

(I learnt a few days after this test that you don't get any guild bonuses if your contract is expired. Hence, I thought that I was matching my partner's Accuracy with the Kalis Ring and the +1 Accuracy guild bonus, but since my contract was expired, the latter was not working)

Results

#	Weapon	Attack	Hits	Misses	Hit Rate	Miss Rate	Sample Size		
I	Liverto	BowMastery X	332	68	83%	17%	400		+2 Base Accuracy
II	Yuria	BowMastery X	280	120	70%	30%	400		
III	Liverto	RoundKick I	313	87	78.3%	21.7%	400		
IV	Yuria	RoundKick I	256	144	64%	36%	400		

Table2

Comments

The difference is big enough that we don't need to resort to any "advanced" computations in order to understand that Liverto>Yuria (in terms of Accuracy). The difference is pretty big honestly.

Serendia Special not working (more Liverto vs Yuria)

Although these tests were conducted to determine whether or not the Serendia Special was working, there is important information contained here, which might help some of you make up your mind as to which off-hand to use.

Environment

Check the top of the images

Results

	Lv55 Ranger->Lv55 Tamer					
	Attack: BowMastery X					
	+4 base Accuracy					
	Tamer using full+15 Grunil					
#	Setup	Hits	Misses	Hit Rate	Miss Rate	Sample Size
I	Yuria+Steel	278	122	69.5%	30.5%	400
II	Yuria+Steel+Serendia	355	145	71%	29%	500
III	Yuria+Bronze	358	42	89.5%	10.5%	400
IV	Yuria+Bronze+Serendia	350	50	87.5%	12.5%	400
V	Liverto+Steel	317	83	79.3%	20.7%	400
VI	Liverto+Steel+Serendia	331	69	82.7%	17.3%	400
VII	Liverto+Bronze	400	0	100%	0%	400

Table3

	Lv55 Ranger->Lv55 Ranger					
	Attack: BowMastery X					
	+4 base Accuracy					
	Ranger using full+15 Ultimate Grunil					
#	Setup	Hits	Misses	Hit Rate	Miss Rate	Sample Size
I	Yuria+Steel	283	117	70.75%	29.25%	400
II	Yuria+Steel+10Acc	328	72	82%	18%	400
III	Yuria+Steel+Serendia	271	129	67.75%	32.25%	400
IV	Yuria+Bronze	363	37	90.75%	9.25%	400
V	Yuria+Bronze+10Acc	400	0	100%	0%	400
VI	Yuria+Bronze+Serendia	352	48	88%	12%	400
VII	Liverto+Steel	329	71	82.25%	17.75%	400
VIII	Liverto+Steel+10Acc	373	27	93.25%	6.75%	400
IX	Liverto+Steel+Serendia	329	71	82,25%	17.75%	400

Table4

Comments

We can easily see that using a Liverto with a Steel ends up in around 80% Hit Rate. Using Liverto+Bronze gives you 100% Hit Rate (I think it's wasted though).

On the other hand, Yuria+Steel is around 70% Hit Rate, and Yuria+Bronze around 90%. Do note that these results (the one with Steel dagger) match the results of the previous test. From these results, one could also conclude that each Accuracy point gives around +1% Hit Chance. I say this because a (blue) Bronze Dagger provides +19 Accuracy, and my hit rate with my Yuria weapon increased by around 20% when I equipped it. Also, when I slotted +10Accuracy worth of items, my Hit Rate increased by roughly 10%. It's just an estimate of course, but I don't think to be too far off the marks.

Also, we can clearly see that Serendia Special is not working (you can check the reliability of this at [this link](#))

Skill facts

By using the results of the Liverto vs Yuria and Liverto vs Kzarka tests, we can find out some interesting facts. Namely, the difference between Bow Mastery I (which gives -0.5% Accuracy) and Round Kick I (which gives 2.25% Accuracy) matches the results I obtained (if we include a small RNG factor). At the same time, the difference between Bow Mastery X (+6.25% Accuracy) and Round Kick I (-0.5% Accuracy) matches my results (if we include a small RNG).

This is really important: all my tests (not only the ones discussed in this document) used Bow Mastery X as a standard. Until now, there were some uncertainties as to how much Accuracy Bow Mastery X provided (it might have been possible that the bonus stacked for each additional rank of the Skill). However, now we know that the total bonus is 6.25%, which means that we can easily "translate" my results for any other skill.

For example, **Blasting Gust III** has +3.75% Accuracy. If we assume that my "true" hit rate with Liverto+Steel (against a full +15 Grunil, same level target) is 80% (with Bow Mastery X), we can easily discover my hit rate if I used Blasting Gust III by applying a simple proportion; namely: $80:106.25=x:103.75 \rightarrow x=78.11\%$

Conclusion

This means that my results are not that much higher than what you'd obtain if you used any other skill.

Class Similarities

I wanted to see how similar Ranger was to other classes, so I had my Tamer friend perform some tests on me. The equipment was the same, but of course the Skill used was different.

Results

		Lv55 Tamer->Lv55 Ranger				
		Attack: LeafLash VI				
		+5 base Accuracy				
		Ranger using full+15 Grunil				
	#	Setup	Hits	Misses	Hit Rate	Miss Rate
	I	Liverto+Needle	313	87	78.3%	21.7%
	II	Liverto+Incense	400	0	100%	0%

Table5

Comments

LeafLash VI provides +1.25% Accuracy. If we were to “translate” these results into Bow Mastery X, we’d have: $x:106.25=78.3:101.25 \rightarrow x=82,16$
...which is extremely close to the results I had when I used the Liverto+Steel (also consider the slightly higher base Accuracy from this test).

Conclusion

Tamer and Ranger seem to work very much alike. You can very easily apply my results to these two classes by applying the necessary formulas (do note that the difference is not that big anyway). I believe that all classes are the same in this regard - that is, every class shares the same Accuracy, the only difference being in the Skill Accuracy modifiers (this is why some classes seem less accurate than others - for example, some Warrior’s skills don’t have any Accuracy modifier tied to them). This is just an assumption, though.

Ultimate Armor vs Non-Ultimate Armor

This was a test to determine if Ultimate Armor provided a bigger Evasion bonus than non-ultimate armor. We could already notice it from the tests Liverto vs Kzarka ([Table1](#)) and Liverto vs Yuria ([Table2](#)) (the only two directly comparable tests were the Round Kick ones with the Liverto).

Results (condensed from Table1 and Table2)

#	Weapon	Attack	Hits	Misses	Hit Rate	Miss Rate	Sample Size
I	Liverto	RoundKick I	313	87	78.3%	21.7%	400
II	Liverto	RoundKick I	322	78	80.5%	19.5%	400

Table6

Do note that I was done with +3 Base Accuracy against a full+15 Ultimate Grunil, whereas II was done with +4 Base Accuracy against a full+15 Blue Grunil.

Comments

The results are extremely close. So close that it would be safe to say that the Ultimate upgrade only helps in reducing the damage you take (and does not help towards your Evasion).

I also did this test, to verify if Grunil had more Evasion than Heve.

Environment

Both tests were conducted with me using a +15 green Yuria with +6 Base Accuracy (provided with 2xDUO:Ring of Good Deeds).

#	Armor	Hits	Misses	Hit Rate	Miss Rate	Sample Size
I	Ultimate Grunil (+15)	226	74	75.3%	24.7%	300
II	2 Grunil-2 Heve (+15)	223	77	74,30%	25.7%	300

Table7

It looks like Heve pieces provide the same Evasion as Grunil's.

TL;DR

- Kzarka **is** more accurate than Liverto (albeit very slightly)
- Liverto **is** more accurate than a Yuria (by a huge margin)
- You can easily translate my results to any other class/skill (knowing that Bow Mastery X's accuracy bonus is only +6.25%).
- Blue Grunil=Ultimate Grunil=Heve (Evasion-wise)

CONCLUSIONS

As you may have guessed, I will not have a lot of free time to play BDO in the near future. This is why it is very likely this will be the last document I'll release for a while.

I'm saddened by the fact that I was not able to prove that DP was made up of two different stats (Evasion and Damage Reduction), but I can't do anything about it. I took over 1 month to find the time to write this last document, and in these 4 weeks I've barely played the game (I only AFK cooked basically, and I've just reached Master rank, which was my goal, yay!).

Suffice it to say that I really, strongly support the theory of DP being made up of two parts. If you want more insight about this, you can check out these comments:

[Link 1](#)

[Link 2](#)

If this turns out to be the truth, it would explain why people with 250AP are tearing through people with 250DP in KR (as there would be a huge amount of that DP being only Evasion).

I thank you all again for reading this. I might still hang around for a while in some Reddit's discussions or in the official BDO's forums, but don't expect much more from myself.

CREDITS

Thanks to **Queez** (from the guild: The Law) and **Tigan** (from the guild: Grind) for helping me in the many testing sessions I had. You've easily wasted close to 10 hours in doing all that, and you deserve all the reader's thanks.

Thanks to the Reddit users **-Degaussed-** and **Evid** for providing the "idea" for some testing sessions (albeit I wasn't able to conduct tests on the -Degaussed-'s idea).

Thanks to the BDO Forums' users **Fire Spin**, **Junkage** and **ExportedShark** for providing important insight and additional testings.

Thanks to **Zen** for helping me in some of the first testing sessions.

Thanks to my guildmates, **Neijo** and **Aldyrin**, for helping me in the very first tests.

Thanks to every user who supported me in these 2 months. I wouldn't have done all this without all your encouraging words.

Parting Screenshot (because epeen)



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