Ordinalcy Calculus: Entangled Avenues Nuanced

By Arthur Shevenyonov

Abstract

Ordinalcy (Orduality, Lativity) does indeed appear to be a most minimalist grand unifying paradigm, or a ToE striking an unparalleled balance of efficacy and efficiency, or Gradiency as opposed to Azimuthality. By the same token, the Ordual (Residuale) calculus integrates across otherwise distant areas toward completeness amid utmost simplicity. In particular, it extends the analysis beyond differential forms (which augment vector calculus in their own right yet might be a special case of Gradiency alone) or conventional as well as modified Poisson-Jacobi. The promising scope of applications will be revealed gradually in further research.

Rehashing on Prior Ordinalcy Implications: A General Lativity

It has been suggested previously that a *relationship* could indeed turn out to be the ultimate building block of matter at large (spiritual as well as physical and social)—indeed allowing for a Gradiency compliant account at each every stage. If one were to take a “fundamentalist” stance, it would be a safe bet to claim:

(C1) A relationship is the essence of matter at each level

(C2) Elements, unless representing a level of relationship or entering one, are neither defined nor real (in other words, particles cannot be thought of as matter per se)

(C3) All of the known interactions could be reduced to a relationship, to be on some levels represented as gravity between chunks of matter, which ultimately amount to higher-level relationships still

(C4) Superstrings, fermions, and waves are ultimately none other but relationships, the latter being alternatively depicted as the isoquants (qualiquants) or slicing layers of the implied CES or Lame function—a family or fibration thereof

(C5) Neither causality nor time exists as genuine ontology, the former being a special case of strongly symmetric relationship and the latter a shadow metric for change or varying aggregation across levels (which tends to crop up based on relational or *lative* gravity across comparable relationship-aggregates rather than as a genuine measure of homogeneous and immanent time dependence)

(C6) For the same token, it is utterly incorrect to reduce causality to time sequencing or timing (with antecedent maintained as the cause)—even though, ironically, any two or more fictions may spawn or connote an existentially and semantically more meaningful relationship (e.g. spacetime, light as a matter-energy or particle-wave phenomenal flip)

(C7) Every layer of matter can be formalized in terms of a *level* of a basic relationship (or a *particular value* for the rho parameter of lativity), whose resemblance is what underlies fractality, or whose perceived phenomenological complexity can completely as well as parsimoniously be accounted for across an arbitrary set of research disciplines as long as they draw on these same [ordual] premises consistently

(C8) This pertains to traditional religious outlooks as well, with the entire continuum or "permitted orbits" of being following essentially the same structural patterns—the latter theme warranting special treatment in forthcoming research.

Zooming in: Beyond Poisson & Jacobi

Even within this broad area, it will now be shown how the simplest dual (or *m=2*) exposition will prove most instrumental as well as sufficient for all practical purposes. The preceding results (Shevenyonov, 2016c) have suggested that the generalized *m-ality* case draws on summation over *m* states or basis *rotations*:

$$\sum_{i=1}^{m} 1/\rho_i \equiv 1$$

For the *permutations* based representation though, the combinatorial power explodes to *m!*:

$$\sum_{j=1}^{m!} 1/\rho_j \equiv 1$$

Bearing in mind their convergence in the dual (or $m \equiv 2$) case only, as well as the reduction options (e.g. by representing any of its select elements or objects as the core, or reference frame in addition to the "third object" *X*, with the remaining ones standing for the residuale), this suggests every reason to revert to the basic case (more so given the very special and multiple yet related roles *X* reserves beyond its prior treatment).

In particular, this is most manifest when checking for Poisson and Jacobi compliance. Consider the original dual accounting or "*conservation and equivalence* identity":

$$(1)\ \ (A,a)^{\rho-1} \sim (a,A)$$

This appears to generalize beyond [non-linear] Poisson brackets, with the lative parameter rho spanning an *unbounded, complete domain* of possible and undefined modes rather than being restricted to any particular "value" (e.g. zero or two). This notion of completeness as *unbounded yet well-defined* structure will be closely intertwined with the role of the third object X as the *floating basis (FB)*—as endogenized beyond [non]variability or [non]functionality.

In passing, note that the somewhat informal bridge of the $A^{\rho-1}\sim a$ sort, drawing upon the analogy with (1), generalizes in its own right the inter-relationship of a *large "value"* ***A*** versus a *small* ***a*** (which can only qualify as such in the context of each other as well as of non-numerical comparison)—beyond rho assuming a value of zero for the two referring to infinity and zero (or an infinitesimal) respectively.

Again, what I tend to posit and build on is a "non-cardinalcy," non-numerical approach, with absolute values carrying little proper meaning. Otherwise, an even more legitimate way of reducing (1) would be to see that, insofar as rho and its dual counterpart generalize 0 and 2 respectively, the left- and right-hand sides could be standing for the likes of a [unity] ratio (or whatever value taken to the power of zero) versus [unity] product (the squared value)—or indeed the reciprocal (inverse) of the former ratio.

Incidentally, as before, (1) can alternatively be represented in *X* terms as follows:

$$(2)\ \ [(A,a),X]=[X,(a,A)]$$

What this suggests is that, as an early indication of being a floating basis, *X* takes on the "*structure-values*" ({Λ, Ω} allusion?) of *(A, a)* versus *(a, A)* when applied as the right versus left action (or in the left versus right), respectively. One way of showing this recursively would be to embark on a Jacobi identity check, with an abstract negative sign substituted for the full-blown $\rho-1$ transition residuale:

$$(2')\ \ [X,(a,A)]=-[(a,A),X]=-[-(A,a),X]$$

This results from the minimalist assumption of symmetry or monotonous correspondence between *sign and position reversal*—for the brackets and ellipses alike, based on a simplest possible Poisson rule (as the generalized non-linear case has been reduced to a pseudo-linear one). By comparing (*2'*) to (2) and rearranging for or canceling out the resultant signs, it obtains that:

$$(3)\ \ [(A,a),X]=[(A,a),-X]$$

More generally, any multiple aside from the minus sign could apply to *X*, as long as a zero "value" for either the left or the right-hand side applies as a sufficient solution. In this case, perfect symmetry obtains as assumed at the outset, though only for the right-action case, i.e. *X=(A, a)*. However, a similar line of reasoning could be reiterated symmetrically with respect to the *(a, A)* semi-kernel to rearrange (2) through (3) to arrive at *(a, A)=X* as one other possibility. For that matter, (*2'*) could directly be applied to arrive at,

$$(3')\ \ \big[[(A,a)-(A,a)],X\big]=0=[0,X]$$

This is to suggest that X can take an "arbitrary" value (or one yet to be set at another level), thus indeed acting as a floating basis of one kind or the other.

Needless to say, this rather informal and anything-but-rigorous schema can at best fetch a hunch on the nature of the structure involved. After all, when applied more carefully, the same LHS (lefthand side) of (*3'*) would, in line with the rules as laid out in Shevenyonov (2016c), suggest $(A, a)^{\rho}$ instead of a zero within the RHS bracket. But that only further points to an even *more involved floating basis* nature of *X*:

$$(4)\ \ [(A, a)^{\rho}, X] = 0\ \leftrightarrow (X, X) \sim X$$

In fact, one other way of showing this would be to invoke on the $a \rightarrow A$ case, which will usher in some unparalleled implications for existential dispute in its own right (Shevenyonov, 2016e). More specifically as per the presently attempted scope:

$$(5)\ \ [(A, A), X] = [X, (A, A)]$$

$$(5')\ \ (A, A)^{\rho-1} \sim (A, A)$$

Arguably, (5) and (*5'*) refer to the exact same asymptotic identity. Were it not for the "infinities" applied, this could qualify as one of the "cardinalcy" cases, or functional *spaces* (bearing in mind that the rho domain is still *indefinitely reducible*). The above-mentioned forthcoming research will, however, demonstrate that cardinalcy or causality is non-existent, or confined to a very special case of theological venue (this paradoxically being narrowed down to the traditional Trinitarian perspectives only).

In any event, it can be shown that (5) can further be generalized as an ultimate induction of the *X=(X, X)* representation for X as the *ultimate floating basis (UFB)*, beyond the $X \equiv (A, A) \sim A$ instance. The Poisson check proceeds as follows:

$$(6)\ \ [(X, X), X] = [X, (X, X)] = -[(X, X), X] \rightarrow [k(X, X), X] \equiv 0$$

Apart from the *X=0* as one candidate solution, what's urged is the posited UFB:

$$(6')\ \ X \sim (X, X)$$

Again, all of these semi-mnemonic speculations have to be supported more rigorously. This is where the weak, generalized Jacobi check would be most invited:

$$\big[x, [y, z]\big] = \big[[x, y], z\big] + [y, [x, z]]$$

In fact, the above depicts the regular notation, essentially boiling down to an *m=3* case basis rotation. One other regular way of expressing the same would be,

$$d_x[y, z] = [d_x y, z] + [y, d_x z]$$

Now, the RHS of (2) can directly be expanded along the regular Poisson lines as,

$$(7.1)\ \ [(A, a), X] + [(a, X), A] + [(x, A), a] = 0$$

In fact, this again refers to a rotating-basis duality as stemming from completeness.

Applying a $(X, B) \equiv d_x B$ convention results in,

$$(7.2)\ \ d_x(a, A) + (A, d_x a) + (d_x A, a) \equiv 0$$

It is straightforward to [arbitrarily!] rearrange (7.2) symmetrically per the *(A, a)* semi-kernel as follows:

$$(7.3)\ \ d_x(A, a) + (a, d_x A) + (d_x a, A) \equiv 0$$

It should be inferred from the previous rationale (based on (1) and (2)) that:

$$(7.4)\ \ [(A, a), (A, a)] = [(a, A), (a, A)]$$

However, from (7.2) and (7.3), it follows that:

$$(7.5)\ \ d_x(A, a) = d_x(a, A)$$

Needless to say, this may not involve the symmetry of the semi-kernels (except for the asymptotic case:

$$(A, a) \neq (a, A)$$

Rather, from (7.5) and (7.2-3) a version of adjusted equality obtains:

$$(7.6)\ \ (A, d_x a) = (a, d_x A)$$

However, this reduces both sides of (7.5) to zero—which is too restrictive a version of (1) and (2), even though these parities still hold formally. In other words, in order to arrive at a more general notion of what LHS and RHS of (1) and (2) amount to, a *modified* version of the Jacobi identity would be needed. As it happens, one readily obtains from (2):

$$(7.7)\ \ d_x(a, A) = (A, a)d_x = d_x(A, a)^{\rho-1}$$

Though a somewhat arcane version of (7.5), this parity still resembles the "Jacobi modified" as underpinning differential forms. The ultimate form of Poisson-Jacobi, capturing the nature of the *X* with an eye on its non-linear action, could thus look as follows:

$$(8)\ \ (B, X) = (X, B^{\rho-1})$$

In retrospect, (8) as a version of (7.7) could have served as the rigorous grounds based on which to induce calculus, in the first place—as one alternative to the $xYx \equiv Y$ premise.

A higher-order corner case of $X = B \equiv (A, a)$ readily applies, too. It could be of interest in its own right how the *unconfined* rho domain (a notion of completeness and simplicity akin to FB and UFB as above), which moreover enters in a non-linear fashion, *generalizes the sign reversal* as with differential forms. For instance, by applying X or d_x as left action to (7.7), one arrives at:

$$(9.1)\ \ d_x^2(a, A) = (A, a) = d_x^2(A, a)^{\rho-1}$$

Likewise, a right-X action would garner:

$$(9.2)\ \ (a,A)=(A,a)d_x^2=(A,a)^{\rho-1}$$

The latter seems right up the originally attempted lane (Shevenyonov, 2016c). However, the former could be seen as new induction. The operator-powers pointing to *incremental* X action, in which light the above can be restated as,

$$(10.1)\ \ \big[X,[X,(a,A)]\big]=\big[X,[(A,a),X]\big]=[X,[X,(A,a)^{\rho-1}]]$$

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$$(10.2)\ \ \big[[X,(a,A)],X\big]=\big[[(A,a),X],X\big]=[[X,(A,a)^{\rho-1}],X]$$

Unbearable Completeness of Ease

So is it all about Ordinalcy, Lativity, and Residuality? My guess would be so. Superstrings, corpuscles, waves, generations of fudge particles—all of that feels so good algebraically, but let's face it: There might be nothing out there but relations, their higher- and lower-level materializations.

Does the basic identity (1-2) showcase a Residuale (as a kind of generalized comparison or distance)? Appear strikingly similar to differential forms? That would be hard to resist. Point to Calabi-Yau manifolds as one instance? *Inter alia*, this is one way I once visualized the Ψ, or "*ons/ens*" (be it the *X* basis or the entire identity, bearing in mind that this notion connotes in excess of *Ψ~(Ψ, Ψ)*), prior to having a slim chance of knowing how these intricacies are dubbed. All conceivable generalizations of the Poisson bracket and Jacobi identity look about as simple. Better yet, the ORG triad (Ordinalcy—Residuality—Gradiency) will soon have been shown to apply in areas as diverse and distant as, the social sciences (optimization and downside cross-market contagion), natural sciences (consider reconciling the chain versus globular representations for the DNA or the orbitals' shapes and *n-p* junctions), or religion and psychology (with similar Ψ patterns applying throughout).

In contrast, K-theoretic accounts might boast unparalleled rigor—but is this complexity recouped in a variety of applications? M-theory might well be offering a coherent visualization for a variety of the otherwise disparate notions and phenomena; but does its sophistication bring to bear on refutability—or doesn't it owe itself to a naïve initial metaphor of analog strings as an elaboration of the ether? Does a *relationship* not generalize this toward greater simplicity as well as conceptual completeness (without denying versatility to down-to-earth applications)? Or do relationships not resemble vectors—with generalized origins, directions, or *n*-tuples—much the way waves and strings do? For that matter, *m*-branes could be all about higher-level relationships (indeed asymmetric-polyhedral simplex or sub-complex equivalents).

With much the same holding for Plato's *eidoi*, or inseparability between *morphe* and *hyle* along Aristotelian lines, one wonders what could have prevented such a calculus from coming to existence millennia ago—or could question its emergence decades down the road.

References

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