Review of: "Comment on "On the linearity of the generalized Lorentz transformation""

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The paper is written with a quite modest goal to further clarify a few computational steps of the reference [1] (Verheest (Am. J. Phys. 90, 425429 (2022)), in the sense that could be useful mostly for educational purposes. As such, the paper does not present any original scientific contribution. It also supplements the referenced paper with a few additional observations.

Unfortunately, the offered explanation of one of the overall "two minor issues" the paper aims to clarify can rather confuse and mislead the reader than facilitate reading of the reference [1]. Namely, the author attempts to explain how the equation (7) [(8*)] leads to the conclusion that is simply stated in [1], that "F is a function of the combined argument x–vt as well as of v." Yet, in doing that, the author leaves a wrong impression that such conclusion also requires equation (6) [(7*)] - by doing some elaborate computation involving (6) (taking further derivatives, then relying on general solutions of wave equations and discussion of results on top of that).

On the other hand, the above conclusion on the functional dependence of F made in [1] in truth follows entirely from relation (7) [(8*)] (and of course it does, for how else could involvement of an additional, otherwise unrelated function G tell us anything about the properties of F: infinitely many functions G satisfying (6) can be obtained for any given function F). If necessary, the reasoning leading from Eq. (6) to the conclusion that F=F(x-vt;v) can be elaborated in detail as follows:

Perform change of variables from x and t to y = x-vt and w = t. Now, using the chain rule for partial derivatives, we obtain (writing here the symbol d instead of partial derivative):

$dF/dx = dF/dy\ dy/dx + dF/dw\ dw/dx = dF/dy;$
$dF/dt = dF/dy\ dy/dt + dF/dw\ dw/dt = -v\ dF/dy + dF/dw;$

Inserting the above in (7) [(8*)] one obtains:

$v\ dF/dy + (-v\ dF/dy + dF/dw) = dF/dw = 0.$

That is, we easily derive that the function F cannot depend additionally on w=t, but only on y=x-vt.

Regardless of whether this reasoning is indeed so obvious (as taken to be in [1] and thus left there without comment), or warrants some explanation as this one, it is certainly wrong to involve the unrelated equation (6) in the explanation.