In general relativity, two spacetime connections are physically equivalent if they are related by a projective transformation. This symmetry gives rise to a projective gauge field called the diffeomorphism field. A dynamical action for the diffeomorphism field may be constructed using a Thomas-Whitehead (TW) connection on the volume bundle over the spacetime manifold. By writing the Dirac action for the TW connection, we can model the interaction between fermions and the projective gauge field. We find that the resulting interaction is chiral, which could have interesting consequences for weakly-interacting fermions such as neutrinos.

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