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Kyle Siegrist* (siegrist@math.uah.edu), University of Alabama in Huntsville, Mathematics Department, Huntsville, AL 35899. *Stochastic processes on a space with a binary relation*. Preliminary report.

Suppose that $(S, \mathcal{S}, \lambda)$ is a measure space, and that $R \in \mathcal{S} \otimes \mathcal{S}$, so that R is a binary relation on S . For $x \in S$, let $A(x) = \{y \in S : (y, x) \in R\}$ and $B(x) = \{y \in S : (x, y) \in R\}$. Let $\mathbf{X} = (X_1, X_2, \dots)$ be an IID sequence of random variables in S with common probability measure μ . We obtain results for certain moments of μ associated with the set function $A(x)$, the reference measure λ , and the “distribution function” $G(x) = \mu(B(x))$. We also obtain results for the process $\mathbf{Y} = (Y_1, Y_2, \dots)$ obtained by thinning \mathbf{X} so that $Y_1 = X_1$ and $Y_{n+1} \in B(Y_n)$ for $n \in \{1, 2, \dots\}$. These results have a particularly nice form when μ has a density function f with respect to λ with the property that the “rate function” $f(x)/G(x)$ is constant. When the relation R is a partial order on S , our results generalize classical results on record variables and the Poisson process, but we consider other types of relations as well. Finally, we consider the case where the reference measure λ is also a probability measure on S . (Received February 02, 2015)