Communicating trends and other patterns in data: Effects of presentation format

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I will be concerned with how people extrapolate from patterns in time series data when making judgmental forecasts and with how their ability to make those forecasts is affected by the way in which the data are presented to them. Only some of the studies I will mention were specifically concerned with climate and weather forecasting.

I discuss four basic characteristics of people's extrapolation performance. First, they damp trends, apparently seeing them as less steep than they are. Second, their forecasts for independent un-trended series are typically too close to the last data point, suggesting that they see sequential dependence in series where it does not exist. Third, their forecasts for desirable quantities tend to be higher than those for undesirable ones, implying that they are affected by optimism. Fourth, their forecasts for trended series tend to be scattered around a trend line rather than lying on one: this may indicate that their extrapolations are representative of how data will appear rather than estimates of the most likely positions of those future data points.

I will then outline three types of format effect. First, graphical data presentation generally has advantages over tabular presentation: trend-damping is less with graphical than with tabular presentation though graphical presentation produces a slightly larger elevation bias (optimism). Second, within graphical formats, line graphs tend to produce better forecasts than bar graphs: in the latter case, forecasts are typically too low as if they were drawn down towards the bars. Third, forecasters appear to see greater sequential dependence in independent data series when those data are represented as line graphs than when they are represented as point graphs: lines between data points appear more suggestive of the possibility that the position of the later point is dependent on the position of the earlier one.