Salience Theory and Human Capital Investment

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Bordalo, Gennaioli and Shleifer (2013) propose a unifying theory of salience in decision-making. An attribute is salient when it "stands out" relative to the alternative choices. A potential application of salience theory is human capital investment, since young individuals could attach disproportionately high attention to professions with salient returns, which could tilt their choices. This may imply that a considerable share of the US labor force is misallocated.

Following the career choice model by Keane and Wolpin (1997), an individual's objective when making career decisions can be modeled the following way

$$V(\mathbf{S}(a), a) = \max_{d_m(a)} \mathbb{E}[\sum_{\tau=a}^{A} \delta^{\tau-a} \sum_{m=1}^{5} h_m(a) R_m(a) d_m(a) | \mathbf{S}(a)] \tag{1}$$

where $h_m(a)$ denotes the salience weight. If $h_m(a) = 1, \forall m, a$, one yields the fully rational model as in Keane and Wolpin (1997). However, according to salience theory in the spirit of Bordalo, Gennaioli and Shleifer (2013), $h_m(a)$ varies over both occupation (m) and age (a) and is determined by the salience of the returns.

Using the salience function proposed by Bordalo, Gennaioli and Shleifer (2012), salience of the expected $R_m(a)$ can be modeled as[1]

$$\sigma(R_m(a), \bar{R}(a) = \frac{|R_m(a) - \bar{R}(a)|}{R_m(a) + \bar{R}(a)} \tag{2}$$

[1] Let's drop the expectation when talking about $R_m(a)$ in the exposition below for the sake of notational convenience.

where $\bar{R}_m \equiv \frac{1}{5}\sum_{m=1}^{m} R_m(a)$ is the reference point.[2] This salience function thus captures the psychological insight that agents pay disproportionately high attention to the career option, whose returns deviate a lot from the reference point.

The salience function in (2) can be evaluated for all career options. Then the rank for each m needs to be determined, i.e.

$$rank_{m'} = 1 \text{ if } \sigma(R_{m'}(a), \bar{R}(a)) = max(\sigma(R_1(a), \bar{R}(a)), ..., \sigma(R_5(a), \bar{R}(a)))$$

$$rank_{m'} = 2 \text{ if } \sigma(R_{m'}(a), \bar{R}(a)) \text{ reaches second highest value}$$

... etc.

Then

$$h_m(a) = \begin{cases} \frac{5}{1+\mu+\mu^2+\mu^3+\mu^4} & \text{if } rank_m = 1 \\ \frac{5\mu}{1+\mu+\mu^2+\mu^3+\mu^4} & \text{if } rank_m = 2 \\ \frac{5\mu^2}{1+\mu+\mu^2+\mu^3+\mu^4} & \text{if } rank_m = 3 \\ \frac{5\mu^3}{1+\mu+\mu^2+\mu^3+\mu^4} & \text{if } rank_m = 4 \\ \frac{5\mu^4}{1+\mu+\mu^2+\mu^3+\mu^4} & \text{if } rank_m = 5 \end{cases} \quad (3)$$

where $\mu \in (0, 1]$ captures the severity of salient thinking.[3] Note that the fully rational case is nested by the case $\mu = 1$. The sum of the weights is equal to the weights in the rational model. The weight of the most salient option (with rank 1) is greater than one while all other options have weight less than one.

This paper also adds to the literature in structural behavioral economics, since it obtains an estimate for μ using data from the field. (See e.g. Dalton et al. (2019) for a previous application of salience theory to field data.)

[2] Alternatively, one could consider $\bar{R} \equiv \frac{1}{5*A}\sum_{\tau=a}^{A}\sum_{m=1}^{m} R_m(a)$.

[3] Bordalo, Gennaioli and Shleifer (2012,2013) denote this parameter by δ. We rename it for the sake of disambiguation.

Bibliography

Bordalo, P., Gennaioli, N. and Shleifer, A., 2012. Salience theory of choice under risk. The Quarterly journal of economics, 127(3), pp.1243-1285.

Bordalo, P., Gennaioli, N. and Shleifer, A., 2013. Salience and consumer choice. Journal of Political Economy, 121(5), pp.803-843.

Dalton, C.M., Gowrisankaran, G. and Town, R., 2019. Salience, myopia, and complex dynamic incentives: Evidence from Medicare Part D (No. w21104). National Bureau of Economic Research.

Keane, M.P. and Wolpin, K.I., 1997. The career decisions of young men. Journal of political Economy, 105(3), pp.473-522.