**for** $i = 1$ to $I$ **do**
  **for** $d = 1$ to $D$ **do**
    **for** $n = 1$ to $N^{(d)}$ **do**
      $z_n^{(d)} \sim P(z_n^{(d)} \,|\, \mathcal{B}, \Gamma, \mathcal{S}, \mathcal{L}, \mathcal{Z}_{\setminus d,n}, \mathcal{W}, \mathcal{Y}, \mathcal{X}, \mathcal{A})$
    **end for**
  **end for**
  **for** $t = 1$ to $T$ **do**
    $l_t \sim P(l_t \,|\, \mathcal{B}, \Gamma, \mathcal{S}, \mathcal{L}_{\setminus t}, \mathcal{Z}, \mathcal{X}, \mathcal{A})$
  **end for**
  $\mathcal{B}, \Gamma, \mathcal{S} \sim P(\mathcal{B}, \Gamma, \mathcal{S} \,|\, \mathcal{L}, \mathcal{Z}, \mathcal{Y}, \mathcal{X}, \mathcal{A})$
**end for**