Algorithm 1 An algorithm to return a canonical unshielded triple of an RCM given a pair of (undirected) dependencies. R_r, R_s, R_t, and $\mathbf{P}$ are as defined in the main text.

procedure GET_ONE_CUT($P.Y - \mathcal{V}_X, Q.Z - \mathcal{V}_Y, \mathcal{M}$)
  $LL := LLRSP$, $eqint := (x, y) \mapsto x = y$ **or** $LL(x, y) + LL(\tilde{x}, \tilde{y}) \leq \min(|x|, |y|)$
  $m := |P|$, $\ell := LL(\tilde{P}, Q)$, $\mathbf{J} := \{(a, b) \mid P^a = Q^b,\ 1 \leq a \leq m - \ell + 1,\ \ell \leq b \leq |Q|\}$

  for (a_r, b_r) **in J such that** $LL(P^{:a_r:-1}, Q^{b_r:}) = LL(P^{a_r:}, Q^{b_r:}) = 1$ **and** $R_r.Z \notin adj(\mathcal{M}, \mathcal{V}_X)$ **do**
    $\ell_\alpha := LL(Q^{\ell:b_r:-1}, P^{:a_r:-1})$
    if $\ell_\alpha = 1$ **then**
      if $eqint(P^{a_r:m-\ell+1}, Q^{\ell:b_r:-1})$ **then**
        return $(\mathcal{V}_X,\ \{P.Y, (P^{:a_r} \bowtie Q^{:b_r:-1}).Y\},\ R_r.Z)$

    else if $\ell_\alpha < b_r - \ell + 1$ **and** $a_r < m - \ell + 1$ **and** $\ell < b_r$ **then**
      for (a_s, b_s) **in** $\{(a, b) \in \mathbf{J} \mid a \leq a_r - \ell_\alpha + 1,\ \ell < b \leq b_r - \ell_\alpha + 1\}$ **such that** $R_s.Z \notin adj(\mathcal{M}, \mathcal{V}_X)$ **do**
        $P_A,\ P_B,\ Q_A,\ Q_B := P^{:a_s:-1},\ P^{a_s:a_r-\ell_\alpha+1},\ Q^{b_s:b_r-\ell_\alpha+1},\ Q^{\ell:b_s:-1}$
        if $LL(P_A, Q_A) > 1$ **or** $LL(P_A, Q_B) > 1$ **or not** $eqint(P_B, Q_A)$ **or** $1 < LL(P_B, Q_B) = \min(|P_B|, |Q_B|)$ **then**
          continue

        for (a_t, b_t) **in** $\{(a, b) \in \mathbf{J} \mid a_r < a \leq m - \ell + 1,\ \ell \leq b < b_s - LL(P_B, Q_B) + 1\}$ **such that** $R_t.Z \notin adj(\mathcal{M}, \mathcal{V}_X)$ **do**
          $P_C,\ P_D,\ Q_C,\ Q_D = P^{a_r:a_t:-1},\ P^{a_t:m-\ell+1},\ Q^{b_t:b_s-LL(P_B,Q_B)+1},\ Q^{\ell:b_t:-1}$
          if $LL(P_C, Q_C) > 1$ **or** $LL(P_D, Q_C) > 1$ **then**
            continue

          if $LL(P_C, Q_D) = 1$ **and** $eqint(P_D, Q_D)$ **then**
            return any of $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_r.Z)$, $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_s.Z)$, $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_t.Z)$

          else if $1 < LL(P_C, Q_D) < \min(|P_C|, |Q_D|)$ **and** $m - \ell + 1 < a_t$ **and** $\ell < b_t$ **then**
            return any of $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_r.Z)$, $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_s.Z)$, $(\mathcal{V}_X,\ \mathbf{P}.Y,\ R_t.Z)$
  return None