



Selective Compatibility Signaling in Recruitment: Reducing Applicant Preference Disclosure While Preserving Employment Matching

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Abstract: Organizations increasingly rely on digital recruitment processes that collect detailed applicant information, including compensation expectations, scheduling constraints, workload preferences, mobility limits, and other sensitive employment-related preferences. Although this information may support hiring decisions, it also requires applicants to disclose private preference structures before either party knows whether a mutually acceptable employment relationship exists. This study proposes Selective Compatibility Signaling (SCS), a recruitment and matching mechanism that evaluates applicant preferences and employer opportunities without requiring direct disclosure of the underlying preference values. Instead, SCS releases a limited outcome indicating whether an applicant and employer have a potentially viable match. The study evaluates SCS through a simulation spanning student employment, travel-intensive home-infusion nursing, faculty hiring, and executive recruitment. Five recruitment approaches are compared using vacancy fill, applicant placement, false rejection of viable matches, direct disclosure, and preference inferability. The full analysis used 40 paired replications and the original study populations. The findings show that the value of compatibility signaling depends on market structure and preference heterogeneity. In student employment, SCS improves fill and placement and reduces false rejection, although it does not reduce threshold inferability. In nursing, matching outcomes remain unchanged while direct preference disclosure falls substantially. Faculty hiring shows improved matching and lower preference inferability, while executive recruitment shows a substantial reduction in preference inferability with largely preserved matching performance. Across the four markets, SCS preserves or improves matching while eliminating exact preference disclosure in the modeled process. The study contributes to recruitment, labor-market matching, and information-governance research by showing that organizations can assess employment compatibility through selective disclosure rather than routine exchange of detailed applicant preferences. It also identifies market complexity, preference heterogeneity, and operational constraints as boundary conditions affecting the value of compatibility-based recruitment.

Keywords: recruitment, labor-market matching, information privacy, information governance, employment decisions, compatibility signaling, data minimization, false rejection

INTRODUCTION

Organizations increasingly rely on digital recruitment systems to identify, evaluate, and match applicants with employment opportunities. These systems often collect extensive

information about compensation expectations, scheduling constraints, workload preferences, geographic limitations, benefit priorities, and other employment requirements. Such information may reduce hiring uncertainty, but it also requires applicants to disclose sensitive preferences before either party knows whether a mutually acceptable employment relationship is feasible. This creates a practical information-governance question: how much applicant preference information must be disclosed to determine whether an employment opportunity is viable?

Contemporary recruitment practices commonly assume that better employment decisions require more information exchange. Employers may request salary expectations, availability, mobility constraints, and other preference-related information early in the hiring process. Although these disclosures may assist matching and negotiation, they can expose an applicant's bargaining position and private decision criteria. Privacy research, by contrast, emphasizes contextual appropriateness and limiting collection to information needed for a defined purpose (Bélanger & Crossler, 2011; Nissenbaum, 2010; Solove, 2006). Recruitment therefore involves a tension between richer information for matching and less disclosure for privacy and responsible data use.

The challenge becomes more significant when employment packages are multidimensional. Applicants may evaluate combinations of salary, bonus, benefits, workload, flexibility, travel, job security, authority, and professional support. Two opportunities with similar salaries can therefore have very different value. As the number of relevant dimensions increases, determining compatibility from a small number of disclosed expectations becomes less reliable, while collecting more detailed preferences expands applicant exposure.

This study examines whether organizations can identify viable employment relationships without routinely receiving an applicant's underlying preference structure. It develops Selective Compatibility Signaling (SCS), a mechanism that compares private applicant preferences with a finite set of feasible employer packages and releases only a constrained compatibility outcome. SCS does not replace qualification screening or make final hiring decisions. It indicates whether continued consideration may be worthwhile while applicants and employers retain their decision rights.

The mechanism is evaluated in student employment, travel-intensive home-infusion nursing, faculty hiring, and executive recruitment. These markets differ in compensation complexity, qualification requirements, and operational constraints. The study compares traditional disclosure, traditional disclosure with employer commitment, compatibility signaling with and without commitment, and a posted-package baseline. Outcomes include vacancy fill, applicant placement, false rejection, direct disclosure, and preference inferability.

The study asks: How can organizations assess applicant-employer compatibility while minimizing disclosure of applicants' underlying preference structures? The findings show that compatibility signaling creates different forms of value across markets. It can improve matching where incomplete communication causes viable pairs to be overlooked, preserve performance while reducing disclosure where hard operational constraints dominate, and reduce preference inferability where packages and applicant preferences are sufficiently heterogeneous.

The study contributes to recruitment and information-governance research in three ways. First, it distinguishes compatibility assessment from direct preference disclosure. Second, it introduces a practical mechanism for separating qualification information from private employment preferences. Third, it identifies market complexity, preference heterogeneity, and operational constraints as boundary conditions that determine whether compatibility signaling creates allocative, informational, or performance-preservation value.

LITERATURE REVIEW

Recruitment and Employment Matching

Recruitment involves matching organizational opportunities with applicants whose qualifications, preferences, and circumstances align with available positions. Employers seek individuals who possess the skills and credentials required for successful performance, while applicants evaluate compensation, working conditions, career prospects, flexibility, benefits, and other job characteristics. Effective recruitment therefore requires the identification of mutually acceptable relationships rather than unilateral evaluation by either party.

Recruitment outcomes are shaped by both the information available to applicants and employers and the way that information is communicated. Applicants form judgments about opportunity attractiveness, while organizations assess capability and the likelihood of offer acceptance (Barber, 1998; Breugh, 2013; Chapman et al., 2005). As compensation and working arrangements become more multidimensional, the task of identifying mutually acceptable matches becomes more difficult.

Information Asymmetry and Signaling

Labor markets are characterized by information asymmetry. Employers typically know more about available opportunities, while applicants possess superior knowledge of their own preferences, constraints, and reservation conditions (Akerlof, 1970). Signaling helps reduce this uncertainty. Credentials, experience, and certifications allow employers to infer applicant capability, while organizational information allows applicants to infer the likely quality of an opportunity (Spence, 1973).

Most labor-market signals communicate characteristics of an applicant or organization. Recruitment also requires information about the relationship between a particular applicant and a particular opportunity. Organizations may therefore request compensation expectations, schedule requirements, geographic preferences, and workload limits. These disclosures may improve prediction but can also affect screening and bargaining. This creates a need for relational signals that communicate whether a viable match exists without exposing every private value used to reach that conclusion.

Privacy, Information Governance, and Data Minimization

The digitization of recruitment has expanded the collection and processing of applicant information. Privacy research increasingly emphasizes control, contextual appropriateness,

and limits on collection rather than secrecy alone (Nissenbaum, 2010; Solove, 2006; Westin, 1967). Information-systems research likewise treats privacy as an organizational and behavioral concern requiring attention to the purposes for which information is collected and used (Bélanger & Crossler, 2011).

Data minimization encourages organizations to collect only information necessary for a defined purpose. The same principle appears in the European Union's General Data Protection Regulation, although the present study does not make a legal-compliance claim (European Parliament and Council of the European Union, 2016). Applied to recruitment, data minimization raises a basic question: must employers receive an applicant's exact preference values, or is a limited compatibility signal sufficient for early-stage decisions?

Person-Job Fit and Employment Compatibility

Person-job and person-organization fit research emphasizes alignment between individual characteristics and work environments (Cable & Judge, 1996; Kristof-Brown et al., 2005). Applicants are more likely to pursue and accept opportunities that match their goals and employment preferences. Organizations likewise benefit when selected applicants find the position acceptable and sustainable.

Existing recruitment processes commonly evaluate fit through direct disclosure and interpretation. Applicants communicate desired compensation, schedules, location limits, or workload expectations, and employers determine whether those conditions can be met. Yet compatibility and preference disclosure are conceptually distinct. A pair may learn that at least one mutually acceptable package exists without exchanging every threshold and tradeoff involved in that assessment.

Research Gap and Hypotheses

Recruitment research highlights the value of information for matching, while privacy and information-governance research emphasizes limiting collection. Existing work offers less guidance on how organizations can identify mutually acceptable employment relationships while withholding applicants' underlying preference structures. SCS addresses this gap by replacing direct preference revelation with a limited relational outcome: incompatible, conditionally compatible, or compatible.

The study evaluates four expectations. H1: SCS with employer commitment preserves vacancy fill relative to traditional disclosure. H2: SCS with employer commitment preserves applicant placement. H3: SCS with employer commitment reduces the inferability of applicants' private thresholds. H4: SCS with employer commitment reduces false rejection of otherwise viable applicant-vacancy pairs.

SELECTIVE COMPATIBILITY SIGNALING FRAMEWORK

Framework Objectives

- Objective 1: Minimize disclosure of applicant preference values. This requirement limits employer-facing information to what is necessary to establish whether a

feasible match exists, while keeping exact thresholds, weights, and tradeoffs outside the ordinary screening workflow.

- Objective 2: Preserve labor-market matching effectiveness. Privacy protection should not materially reduce the system's ability to fill vacancies or place applicants, so SCS is evaluated against traditional disclosure using matching and noninferiority outcomes.
- Objective 3: Preserve employer and applicant decision autonomy. The framework supports continued consideration and package evaluation without converting compatibility into a hiring mandate; employers retain selection authority and applicants retain the right to reject any offer.
- Objective 4: Reduce false rejection of viable matches. SCS should identify applicant-vacancy pairs that are mutually feasible under at least one package but might be screened out when communication is incomplete, omitted, or simplified.
- Objective 5: Produce auditable, reproducible compatibility outcomes. Compatibility decisions should be traceable to explicit qualification rules, hard constraints, utility thresholds, finite package menus, commitment conditions, and stable simulation inputs.

Framework Features

- Feature 1: Reveal compatibility outcomes rather than underlying preference values. The system communicates incompatible, conditionally compatible, or compatible, allowing decision makers to assess whether continued consideration is warranted without receiving the private inputs used in the calculation.
- Feature 2: Separate qualification disclosure from preference disclosure. Employers continue to observe information needed to classify an applicant as not qualified, qualified, or preferred, while compensation, workload, mobility, and risk preferences remain within the compatibility process.
- Feature 3: Represent employer opportunities as finite, budget-feasible package menus. Each vacancy is modeled as a bounded set of credible alternatives, which makes compatibility computable, ties the signal to actual employer choices, and permits budget and dominance checks.
- Feature 4: Evaluate both applicant and employer utility before labeling a package viable. A package is treated as viable only when mandatory constraints pass and both sides meet their utility thresholds, preventing compatibility from becoming a one-sided measure of applicant acceptance.
- Feature 5: Use commitment constraints to increase the credibility of compatibility signals. Locked conditions prevent the employer from strategically worsening the menu after compatibility has been signaled, so the released outcome continues to refer to a stable opportunity set.
- Feature 6: Escalate conditional cases rather than forcing binary automated decisions. When the default package is not viable but another menu option is, SCS marks the

dyad as conditionally compatible and preserves a structured role for human review or negotiation.

Framework Components

The applicant model includes occupation, archetype, perturbed preference weights, qualifications, mandatory credentials, private thresholds, and employment state. The vacancy model includes occupation, subtype, mandatory requirements, qualification weights, qualified and preferred package menus, default packages, budget, and commitment state. Packages vary by market: wage, hours, schedule, and delay for student jobs; compensation, travel, mileage, on-call burden, and work duration for nursing; salary, research support, teaching load, summer support, and course release for faculty; and total compensation, cash/equity composition, protection, and authority for executives.

The compatibility engine first classifies an applicant as not qualified, qualified, or preferred. It then evaluates the corresponding finite menu. A package is viable when mandatory constraints pass, applicant utility meets the acceptance threshold, and employer utility meets its threshold. A default viable package is labeled compatible; a non-default viable package is labeled conditionally compatible; and absence of a viable package yields incompatible. Table 1 distinguishes the five experimental conditions by disclosure logic and commitment status.

Compatibility Assessment Process

The framework follows a bounded compatibility-assessment process. First, employer requirements classify the applicant as not qualified, qualified, or preferred. Second, the corresponding finite package menu is evaluated against mandatory applicant constraints. Third, applicant and employer utility thresholds are applied to the surviving packages.



Figure 1: Selective Compatibility Signaling Framework

Note: The framework combines private applicant preferences with a bounded employer opportunity set and releases only a compatibility category for early-stage recruitment decisions.

Fourth, the framework returns incompatible when no package is viable, compatible when the default package is viable, or conditionally compatible when only a non-default package is viable. Fifth, conditional cases may be escalated for human review. The signal supports whether consideration should continue; it does not select the applicant, set the final offer, compel negotiation, or determine acceptance. Figure 1 summarizes the framework and its employer-facing outcomes.

Experimental Conditions

Table 1: Experimental conditions

Condition	Disclosure logic	Commitment
Traditional	Applicant preferences are partially observed through omission-prone communication	Unlocked
Traditional Locked	Traditional communication	Locked
SCS Unlocked	Compatibility and tier outputs	Unlocked
SCS Locked	Compatibility and tier outputs	Locked
Posted Package	Applicants self-screen against posted defaults	Posted/locked

RESEARCH METHOD

Research Approach

The study uses simulation to compare recruitment approaches under controlled conditions. Simulation is appropriate at this stage because SCS has not yet been deployed in an operational recruitment system. It allows the same applicants and vacancies to be evaluated under different information-sharing rules, so observed differences can be attributed to the recruitment approach rather than to different labor-market populations. The main comparison is between traditional preference disclosure and SCS with employer commitment. Employer commitment means that the package menu used to generate a compatibility signal remains available during the matching process. This prevents a favorable signal from being based on an opportunity that is later withdrawn or weakened.

Labor-Market Settings

Four settings were selected to represent different levels of compensation complexity and operational constraint. The student market emphasizes wage, hours, schedule, and hiring delay. The travel-intensive home-infusion nursing market emphasizes compensation, travel, mileage, on-call obligations, and workload. The faculty market includes salary, teaching load, research support, summer funding, and course release. The executive market includes total compensation, cash-equity composition, protection, and authority. Each replication included 1,000 student applicants and 1,000 vacancies; 800 registered-nurse applicants and 1,000 vacancies; 300 faculty applicants and 150 vacancies; and 120 executive applicants and 100 vacancies. The full analysis used 40 paired replications. Occupational sources informed model construction rather than supplying observed outcomes. AACSB International's faculty salary report informed faculty compensation ranges, and the Kavea Compensation Consultants article and The Conference Board's 2026 CEO pay release informed the initial executive-compensation ranges (AACSB International, 2026; Kavea Compensation Consultants, n.d.; The Conference Board, 2026).

Recruitment Conditions

Five approaches were compared: traditional preference disclosure, traditional disclosure with employer commitment, SCS without commitment, SCS with commitment, and posted-package self-screening. Under traditional disclosure, employers interpret compatibility from the applicant information communicated during recruitment. Under SCS, the system evaluates private preferences against feasible employer packages and releases only a compatibility outcome and qualification tier.

Compatibility Assessment

The process begins by determining whether an applicant meets the vacancy's qualification requirements. For qualified applicants, the mechanism evaluates the employer's feasible packages against mandatory constraints and the minimum conditions required by both parties. If the default package is acceptable, the result is compatible. If only another feasible package is acceptable, the result is conditionally compatible and may be reviewed by the parties. If no package is mutually acceptable, the result is incompatible. Final hiring, negotiation, and acceptance decisions remain with the employer and applicant.

Measures

Matching effectiveness was measured by vacancy fill rate and applicant placement rate. False rejection captured cases in which a viable applicant-vacancy pairing existed but was screened out by the recruitment process. Disclosure measures recorded whether exact or categorical preference information was released. Privacy was assessed by estimating how accurately an observer could infer selected private thresholds from the information available under each approach. Lower estimation accuracy indicates that the released information reveals less about the underlying preference.

Analysis

The analysis compared SCS with commitment against traditional disclosure within each market. Fill and placement were considered preserved when SCS was no more than two percentage points worse than traditional disclosure. Privacy improvement required lower threshold-estimation accuracy, and false-rejection improvement required a lower false-rejection rate. Results were examined separately by market because the mechanism was expected to create different benefits under different compensation structures, preference distributions, and operational constraints.

Table 2: Market populations and sampling limits

Market	Applicants	Vacancies	Evaluations per vacancy/round	Applicant cap
Student	1,000	1,000	5	5
Registered nurse	800	1,000	4	5
Faculty	300	150	8	4
Executive	120	100	10	3

RESULTS

Analysis Quality and Main Comparison

The analysis used 40 paired replications and the full populations reported in Table 2. Structural validation found no errors, and the estimated effects were sufficiently stable for the planned comparisons. Three calibration measures remained outside their target ranges: executive offer utility, the upper end of student utility, and the nursing package-rejection rate. These departures are treated as limitations when interpreting the size of the market-specific effects.

Market Results

The main comparison evaluates SCS with employer commitment against traditional disclosure. Tables 3 and 4 summarize whether SCS preserved vacancy fill and applicant placement, reduced preference inferability, and lowered false rejection in each market.

Table 3: Confirmatory H1-H4 results by occupational market

Hypothesis	Outcome	Decision rule	Final market estimates	Status
H1	Vacancy fill rate	One-sided LCB > -0.02	Student +0.1278 (LCB +0.1248); RN 0.0000 (LCB 0.0000); Professor +0.0412 (LCB +0.0353); CEO +0.0035 (LCB +0.0005)	Supported in all markets
H2	Applicant placement rate	One-sided LCB > -0.02	Student +0.1278 (LCB +0.1248); RN 0.0000 (LCB 0.0000); Professor +0.0206 (LCB +0.0177); CEO +0.0029 (LCB +0.0004)	Supported in all markets
H3	Preference-estimation accuracy	SCS Locked < Traditional	Student 1.000/1.000; RN 1.000/1.000; Professor 0.692/0.846; CEO 0.134/0.533	Supported for Professor and CEO
H4	Dyadic false rejection	SCS Locked - Traditional < 0	Student -0.0568; RN -0.000049; Professor -0.0513; CEO -0.0077	Supported in all markets

Note. Effects compare SCS with employer commitment against traditional disclosure. Positive fill and placement differences favor SCS; lower privacy accuracy and negative false-rejection differences indicate improvement.

Student Employment

SCS increased both vacancy fill and applicant placement from 46.46% to 59.24%, a gain of 12.78 percentage points. False rejection fell from 5.68% to zero, and exact preference disclosure was eliminated. Threshold-estimation accuracy remained 1.000 under both approaches, so the student market demonstrates improved matching and disclosure reduction, but not lower inferability.

Registered Nursing

Registered-nurse fill and placement remained unchanged at 42.40% and 53.00%, respectively. SCS nevertheless eliminated exact disclosure and substantially reduced

categorical disclosure. Preference-estimation accuracy remained 1.000 under both approaches, indicating that operational constraints, rather than the disclosure mechanism, dominated matching in this market.

Faculty Hiring

In faculty hiring, SCS increased vacancy fill from 60.72% to 64.83% and applicant placement from 30.36% to 32.42%. False rejection fell from 5.13% to zero, exact disclosure was eliminated, and threshold-estimation accuracy declined from 0.846 to 0.692. This market therefore shows matching, disclosure, and inferential-privacy gains together.

Executive Recruitment

In executive recruitment, SCS produced small favorable changes in fill and placement while substantially reducing preference inferability. Threshold-estimation accuracy declined from 0.533 to 0.134, false rejection fell from 0.77% to zero, and exact disclosure was eliminated. The principal business value in this thin, selective market is stronger preference protection with preserved matching performance.

Cross-Market Comparison

Table 4: Four-market results and reported success status

Market	Fill difference	Fill LCB	Placement difference	Placement LCB	Privacy accuracy: SCS / Traditional	FRR-D difference	Market success
Student	+0.1278	+0.1248	+0.1278	+0.1248	1.000 / 1.000	-0.0568	No: H3 failed
RN	0.0000	0.0000	0.0000	0.0000	1.000 / 1.000	-0.000049	No: H3 failed
Professor	+0.0412	+0.0353	+0.0206	+0.0177	0.692 / 0.846	-0.0513	Yes
CEO	+0.0035	+0.0005	+0.0029	+0.0004	0.134 / 0.533	-0.0077	Yes
Aggregate rule	+0.0431	Not pooled	+0.0378	Not pooled	0.706 / 0.845	-0.0290	Yes: H1-H4 and harm safeguard

Note. Market success requires all four criteria within a market. The aggregate row is an unweighted summary and does not override market-specific results.

The cross-market pattern is more informative than a single pooled effect. Student employment shows the largest matching gain; nursing shows disclosure reduction with neutral matching; faculty hiring combines matching and privacy gains; and executive recruitment shows the largest reduction in preference inferability. These differences indicate that preference heterogeneity, package complexity, and hard operational constraints determine the form of value SCS creates. Figure 2 summarizes the primary form of business value observed in each market.

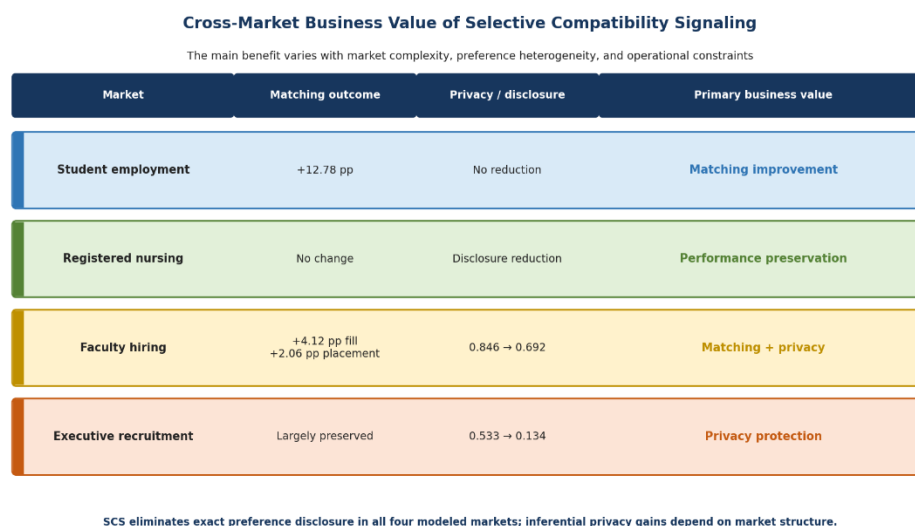


Figure 2: Cross-Market Business Value of Selective Compatibility Signaling

Note. Matching values compare SCS with employer commitment against traditional disclosure. Privacy values report threshold-estimation accuracy, where lower values indicate less inferability.

Robustness and Scope of Inference

Privacy results were checked under several observation-error assumptions and the same market pattern remained evident. The findings apply to the modeled populations, package menus, thresholds, and communication rules. They do not establish protection against external data matching, collusion, repeated strategic probing, or other information sources outside the simulation.

DISCUSSION

Rethinking Employment Matching as a Disclosure Problem

Organizations commonly attempt to improve recruitment by collecting more information from applicants. Compensation expectations, scheduling constraints, workload preferences, geographic limits, and benefit priorities are often treated as necessary inputs. The findings challenge the assumption that improved matching always requires expanded preference disclosure. Across the four modeled markets, SCS either preserved or improved matching while eliminating exact preference disclosure in the employer-facing process.

SCS changes the informational unit used in early-stage recruitment. Instead of asking employers to interpret an applicant's private thresholds, the mechanism asks a narrower question: does at least one feasible package satisfy both parties? The resulting signal supports a decision about whether consideration should continue. It does not select the applicant, determine the final package, or require acceptance.

Market Differences and Boundary Conditions

The results do not show a single universal effect. In student employment, SCS mainly produced allocative value. Fill and placement increased by 12.78 percentage points and

false rejection declined, but threshold-estimation accuracy remained unchanged. The relatively narrow package space and fixed modeled thresholds made the private value easy to infer even when it was not directly disclosed.

The nursing market produced performance-preservation value. Fill and placement were identical across conditions, while exact and categorical disclosure fell. Travel, paid time, workload, and related feasibility constraints dominated the final hiring outcome, leaving little room for the information-sharing mechanism to change aggregate matching.

Faculty hiring produced allocative and informational value together. SCS improved vacancy fill by 4.12 percentage points, improved applicant placement by 2.06 points, reduced false rejection, and lowered threshold-estimation accuracy. Executive recruitment showed the largest relative privacy improvement, with threshold-estimation accuracy falling from 0.533 under traditional disclosure to 0.134 under SCS, while matching was largely preserved. These differences identify three boundary conditions. First, compatibility signaling has greater privacy value when preferences are heterogeneous. Second, it has greater matching value when incomplete communication causes viable packages to be overlooked. Third, hard operational constraints can limit treatment differences even when disclosure is reduced.

Contributions to Recruitment and Information Governance Research

The study contributes to recruitment research by separating compatibility assessment from preference disclosure. Conventional processes often treat disclosure as the means by which fit is established. The findings show that a relational signal can sometimes provide sufficient information for continued consideration without revealing the applicant's complete preference structure. Rather than proposing a new decision technology, the study shows how recruitment processes can be structured to reduce preference disclosure while preserving matching effectiveness.

The study also contributes to information-governance research by moving privacy protection upstream. Many organizational controls focus on securing information after collection. SCS instead asks whether exact preference information must enter the employer-facing process at all. This approach applies data minimization to the design of the recruitment decision rather than only to storage and access controls. Finally, the study identifies selective disclosure as a broader organizational design strategy. Decision processes do not always improve by maximizing information volume. In settings where a limited relational outcome answers the immediate decision question, organizations may be able to reduce exposure, processing burden, and bargaining concerns without reducing decision usefulness.

Practical Implications

Employers considering compatibility-based recruitment need credible, feasible package menus. A signal is meaningful only if the packages used to generate it are actually available and acceptable to the organization. Commitment therefore strengthens trust in the result. Employers should also maintain a separate qualification process so that legitimate capability screening is not obscured by preference privacy.

Recruitment platforms could implement SCS as a pre-selection and pre-negotiation module. Applicants would retain private thresholds, employers would provide bounded package options, and the platform would return a compatibility category rather than a preference profile. Conditional cases should be escalated for human review, and both parties should retain the authority to negotiate or decline. Applicants may benefit from delaying disclosure of sensitive bargaining information until mutual viability has been established. Organizations may benefit from lower data exposure and clearer limits on how preference information influences screening. These benefits do not establish legal compliance, which would require jurisdiction-specific review.

Limitations and Future Research

The evidence is simulation-based. The study demonstrates how the mechanism behaves under the modeled rules, populations, and package structures, but it does not establish that applicants or recruiters would understand, trust, or adopt SCS in practice. The synthetic markets support analytical comparison rather than statistical generalization to occupational populations.

The finite-menu assumption is also a boundary condition. SCS is most applicable where employment opportunities can be represented as a bounded set of credible packages. Unmodeled preferences, changing circumstances, organizational culture, interpersonal judgments, strategic behavior, and negotiation dynamics may affect real outcomes. The privacy analysis is limited to the modeled outputs and does not cover external data fusion, collusion, repeated strategic queries, compromised services, or side-channel information. The study also does not evaluate demographic fairness, implementation cost, legal validity, or long-term employment quality. Three calibration diagnostics fell outside their stated targets and should be considered when interpreting the magnitude of the student, nursing, and executive results.

Future research should progress from simulation to laboratory and field studies. Studies with applicants and recruiters should examine comprehension, trust, willingness to disclose, reactions to conditional compatibility, and perceived control. Technical work should test resistance to repeated-query attacks and evaluate secure-computation implementations. Organizational research should examine menu construction, governance, fairness, adoption costs, and realized employment outcomes.

IMPLICATIONS FOR RECRUITMENT SYSTEM DESIGN

Compatibility Assessment Without Preference Disclosure

When applicant and employer requirements can be compared across a bounded set of feasible packages, a compatibility outcome can guide continued consideration without revealing the underlying preference values.

Commitment Strengthens Matching Credibility

Compatibility is more credible when the opportunity set cannot be strategically revised after signaling. Commitment is therefore not merely a treatment condition; it is a design mechanism.

Privacy and Matching Can Coexist

Information minimization can preserve recruitment outcomes when private preferences are converted into task-specific compatibility information rather than disclosed directly.

Reducing False Rejection of Viable Candidates

Direct evaluation of mutual acceptability can identify viable pairs that unilateral screening or incomplete communication would reject.

Information Design as Organizational Innovation

Organizational innovation can arise from redesigning the information exchanged during recruitment, not only from improving prediction or optimization.

These principles may generalize to school admissions, internal staffing, contractor marketplaces, clinical placement, volunteer coordination, and other matching domains where participants possess sensitive thresholds and decision rights.

CONCLUSION

This study examined whether organizations can identify viable employment relationships while reducing disclosure of applicants' underlying preference structures. The findings demonstrate that compatibility assessment and preference disclosure are not necessarily the same activity. Rather than requiring applicants to reveal detailed thresholds and tradeoffs, organizations may be able to evaluate whether at least one mutually acceptable employment package exists through a constrained compatibility signal.

The benefits vary by labor market. Student employment primarily shows improved matching and lower false rejection. Nursing shows reduced disclosure with unchanged matching. Faculty hiring shows matching, false-rejection, and privacy gains, while executive recruitment shows a substantial reduction in preference inferability with largely preserved matching. Market complexity, preference heterogeneity, and hard operational constraints therefore shape the form of value that compatibility signaling creates.

The broader implication is that effective recruitment may not always require extensive disclosure of applicant preferences. Organizations often frame hiring as a problem of obtaining more data. SCS demonstrates an alternative: structure information around the decision that must be made and disclose only the relational outcome needed at that stage. This approach can support employment matching while advancing data-minimization and information-governance objectives.

The evidence remains simulation-based and requires validation through behavioral and field research. Nevertheless, the results provide initial support for compatibility-based recruitment as a practical alternative to routine preference revelation. By treating recruitment as both a matching problem and an information-governance problem, the study offers a foundation for developing employment systems that preserve decision rights while reducing unnecessary exposure of sensitive applicant information.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the author used Microsoft 365 Copilot to support manuscript organization, language refinement, section integration, editorial revision, and summarization of the CEO-compensation source used to inform initial simulation parameters. After using this tool, the author reviewed and edited the content and parameter interpretation as needed and takes full responsibility for the content of the published article and the model inputs.

Declarations

Author contributions: Michael J. Douglas is the sole author and is responsible for the study conception, framework development and implementation, methodology, analysis, interpretation, visualization, and manuscript preparation.

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Data and code availability: Replication materials are available at <https://github.com/drmdouglas/Selective-Compatibility-Signaling>.

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