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Interactive Effects of Order Assignment Strategy and Information Disclosure on Courier's Continuance Participation Intention Arising in the On-Demand Logistics

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Abstract: The application of crowdsourcing in logistics is a revolutionary change of urban distribution. The on-demand logistics is one of the typical crowdsourcing logistics modes which is popular in China since 2008, the demand volume of Chinese on-demand logistics was about 18.5 billion in 2019 with annual rate of growth about 37.6%, and the average annual growth rate in recent five years was 73.7%, the market scale reached 131.3 billion yuan with annual rate of growth about 33.8%, and due to the impact of Covid-19, the demand of on-demand logistics is increasing significantly, and the requirement for convenience and personalized services is changing sharply, the accelerating iteration of on-demand logistics patterns causes a downward trend of delivery income that it's difficult for the platform to balance the operation cost and labor motivation from the perspective of revenue. The prior research in crowdsourcing logistics focuses on the influence of continuance participation intention from the perspectives of external and internal incentive. However, incentive researches are unsuitable for current background of the downwards trend of delivery income completely. And the characteristics of instability, unsafety and unfairness of couriers occupation which were reported by social news not only the reasons of high turnover rate and mismatching of supply-demand, but also point to the problem of management mechanisms such as incentive mechanism, order mechanism and information mechanism.

As our knowledge, platform mechanism influence couriers' daily tasks immediately but the related researches are absent in crowdsourcing logistics, especially considering the order receiving and completing which is the first concern of courier, order mechanism and information mechanism will influence the order receiving and completing directly. Order mechanism means platform assigns orders to courier, it's the guarantee of matching supply and demand (couriers and orders), as well as the full coverage of the orders. There are different order assignment strategies, from the perspective of the human resources, evaluating performance and setting grades is common strategy, grades is the principles for orders assignment priority to encourage employees with good service quality to stay. In order to guarantee the timeless, some platforms will assign orders from perspective of space. This research summarized the two kinds of order assignment strategies as performance-priority strategy and distance-priority strategy. In performance-priority order assignment strategy, the courier will get an evaluation grade and differentiated orders assignment priority according to their total number of completed orders, total mileage, punctuality rate, praise rate and other indicators. The distance-priority order assignment strategy sends orders to the neighboring courier according to the distance from the orders and the stores, and give priority to the closer courier.

Information mechanism provides platform labor with assistance, which focuses on the information content of user interface that disclosure by platform. The quantity and accuracy of the information have significant influence on users' intention and behavior, and the richness of information content as an important dimension of information characteristics affects the information receivers' behavior immediately. Therefore, according to the operation information in Chinese on-demand logistics platform, this research summarized the information content and conclude two levels of information disclosure in on-demand logistics: one is overall layout information, the number of orders and courier, location layout and real-time traffic information; the other one is individual specific information, order details (distribution revenue goods category, merchant location and time requirements of each order) and transportation capacity details (the level and ranking of

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each courier on the platform). Each information disclosure includes three aspects: order, capacity and transportation. Detailed information disclosure includes two levels of information: overall layout and individual specific information. Brief information disclosure only includes overall layout information.

To abstract differences in orders and information mechanisms specifically, and control other mechanisms (such as incentive mechanism) keep consistent better to highlights the effects of the research object, this research designed experiments based on justice theory for Chinese couriers, considered different orders assignment strategy (Performance-priority vs. distance-priority) and information disclosure (detailed information vs. brief information), introduced information justice and distribution justice perception as mediation to investigate the interaction between order assignment strategy and information disclosure, analyzed the moderating path of work experience and proactive personality. With a sample of 340 part-time and full-time couriers, experiment 1 results showed that the interaction between order assignment strategy and information disclosure in on-demand logistics significantly affects the continuance participation intention of couriers, especially under performance-priority order assignment strategy disclosure detailed information(vs. brief information), but under distance-priority order assignment strategy there were no difference in continuance participation intention between detailed and brief information disclosure which showed the ceiling effect of information disclosure, brief information already contains the basis information of distance-priority order assignment strategy, more detailed information would not improve continuous participation intention significantly. Information justice and distributive justice played a significant mediating role, and work experience and proactive personality moderate the above interaction relationships. However, the results of experiment 2 with a sample of 180 part-time couriers indicated that the mediating effect of distributive justice and the moderating effect of proactive personality were both insignificant, which showed the purposefulness and proactiveness characteristics of part-time couriers, .

The research reveals the mechanism of justice perception on continuous participation intention and the process of information understanding and utilization in crowdsourcing logistics platform, provided specific management suggestions for the platform to attract delivery capacity by setting order assignment strategy and information disclosure when the distribution income is gradually stabilized. Future, more mechanism can be introduced with appropriate justice perception, and more group characteristics of crowdsourcing logistics participants can be considered.

Keywords: On-demand logistics, Order assignment strategy, Information disclosure, Justice perception, Continuous participation intention