

## WHY IS UNDEREMPLOYMENT RELATED TO CREATIVITY AND OCB? A TASK-CRAFTING EXPLANATION OF THE CURVILINEAR MODERATED RELATIONS

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**Based on the job-crafting perspective, we theorized a serial curvilinear mediated moderation model that links underemployment to two outcomes that benefit the organization: creativity and organizational citizenship behavior. A three-waved time-lagged survey of teachers and a field study of technical workers provided convergent support for this model. In Study 1, using data from 327 teachers and their immediate supervisors, we found support for our hypotheses that perceived underemployment had an inverted U-shaped relationship with task crafting and that this relationship was moderated by organizational identification. When the teachers' organizational identification was high, they engaged in more task crafting for the organization at intermediate levels of perceived underemployment. We also found that task crafting was positively related to creativity and organizational citizenship behavior. In Study 2, the simulation tasks for 297 technical workers provided convergent evidence for the idea that objective underemployment indirectly influences objective task crafting through perceived underemployment with the inverted U-shaped path from perceived underemployment to task crafting. We discussed the theoretical and practical implications of this research.**

Statistics have shown that a significant proportion of workers worldwide are underemployed, or working at a job that is below their capacity (McKee-Ryan & Harvey, 2011). Researchers have estimated that underemployment ranges from 17% to two-thirds of the workforce in Asia, Europe, and North America (Bureau of Labor Statistics, 2010; Liu & Wray, 2012). Research on the consequences of underemployment is increasingly important not only in the West but also in other parts of the world. Globally, almost half of employees (47%) currently feel overqualified for their jobs, especially employees in China (84%), Turkey (78%), and Greece (69%). In Hong Kong and China, 71% and 65% of employees, respectively, reported having colleagues

working below their educational levels (Global Press Report, 2012). Because underemployment involves a significant portion of the workforce across a wide range of geographic, economic, and demographic conditions (Erdogan & Bauer, 2009), advancing our understanding of employee reactions to underemployment is imperative.

Most prior studies have focused on employees' negative reactions to perceived underemployment, such as turnover intention, deviance, and absenteeism (e.g., Feldman, 1996; Kraimer, Shaffer, & Bolino, 2009). This focus may relate to an assumption that the content of a job is fixed. If underemployment uniformly led to negative reactions, the managerial implications would simply be to avoid hiring the underemployed. However, these implications are premature because the perception of underemployment may propel employees to take an active stand and craft their tasks, instead of passively accepting the fixed content of their jobs.

*Task crafting* is a primary form of job crafting that focuses on altering task boundaries, such as the

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number, scope, and sequencing of work tasks (Wrzesniewski & Dutton, 2001). The job-crafting perspective posits that employees do not merely passively accept their jobs; but can be proactive and strive to assert themselves in the workplace (Bandura, 2001). The perception of having their qualifications underutilized drives underemployed individuals to maintain their positive self-image and initiate corresponding strategies to redesign their jobs for a better fit (Wrzesniewski & Dutton, 2001). Hence, underemployment may result in positive reactions via task crafting, but the relations among such reactions may be complex and contingent upon certain conditions. Few studies have examined this interesting possibility. Thus, the present investigation aims to reveal the complex path from underemployment to positive outcomes at work. Revealing this complex path has significant managerial implications. If underemployment can lead to positive reactions under certain circumstances, managers may work to create these favorable conditions to encourage underemployed workers to fully utilize their skills through task crafting at work. Such research may also inform managers that hiring underemployed people may not be detrimental. In fact, we found that workers with low to moderate levels of underemployment can make positive contributions to their organization.

We studied two positive reactions to underemployment: creativity, which involves generating new and useful ideas regarding products, services, practices and procedures (Shalley, Zhou, & Oldham, 2004), and organizational citizenship behavior contributing to the organization (OCBO), which promotes the effective functioning of the organization (Organ, 1997). Creativity focuses on doing something novel and useful, whereas OCBO focuses on doing something more; together, they represent key contributions that the underemployed may make to organizations. Organizations today compete in a dynamic and uncertain environment in which creativity and OCBO are highly valuable (Zhou & Hoever, 2014). Crafting their tasks may enable employees to generate new and useful ideas regarding products, services, practices, and procedures, which is the definition of creativity (Shalley et al., 2004). The underemployed workers have underused capabilities and more time to engage in extra activities at work because they can complete their assigned tasks more quickly than those who are not underemployed (Liu & Wang, 2012).

While underemployment may lead to creativity and OCBO through task crafting, we argue that

underemployed workers are likely to engage in task crafting when their perceived underemployment is at low to moderate levels. When perceived underemployment is too high, they may be too demotivated to craft. Thus, the two variables have an inverted U-shaped relation. From the job-crafting perspective, we further theorize that the curvilinear effect of underemployment on task crafting is moderated by *organizational identification*—that is, the extent to which employees embrace oneness with their organization and include organizational attributes in their self-definition (Dutton, Dukerich, & Harquail, 1994).

By examining the curvilinear mediated moderation model, we make three contributions to the underemployment and creativity literature. First, whereas prior research has primarily focused on the negative outcomes of underemployment (e.g., Feldman, 1996; Johnson & Johnson, 2000), we investigate creativity and OCBO as positive outcomes of underemployment. Investigation of positive outcomes is of particular importance for the underemployment literature because most employees may feel underemployed to some degree as they gain more experience on the job (Liu & Wang, 2012). While promoting all employees who feel underemployed is unrealistic, our investigation informs managers and employees about strategies to channel an undesirable situation into positive outcomes (Maynard, Taylor, & Hakel, 2009).

Second, we identify task crafting as the mediator explaining why perceived underemployment affects creativity and OCBO. Part of the reason for the sparse research on positive outcomes of perceived underemployment is the neglect of employee coping strategies. We contribute to the literature by offering a new perspective on how the underemployed may actively cope with their situation by engaging in task crafting under certain circumstances. Further, we identify an important factor, organizational identification, which promotes task crafting as the active coping strategy. We also contribute to the job-crafting literature by identifying underemployment as an antecedent of task crafting.

Third, our study has important implications for managers. We show that those with low to moderate levels of underemployment can use their excess capabilities to engage in creativity and OCBO. This finding may encourage managers to change their mindset from passively avoiding underemployment to actively encouraging the underemployed to engage in task crafting. This mindset change may influence managerial decisions in hiring, training, and

performance appraisal in an era in which underemployment is prevalent (Bashshur, Hernandez, & Peiró, 2011).

### POSITIVE REACTIONS TO UNDEREMPLOYMENT: A JOB-CRAFTING PERSPECTIVE

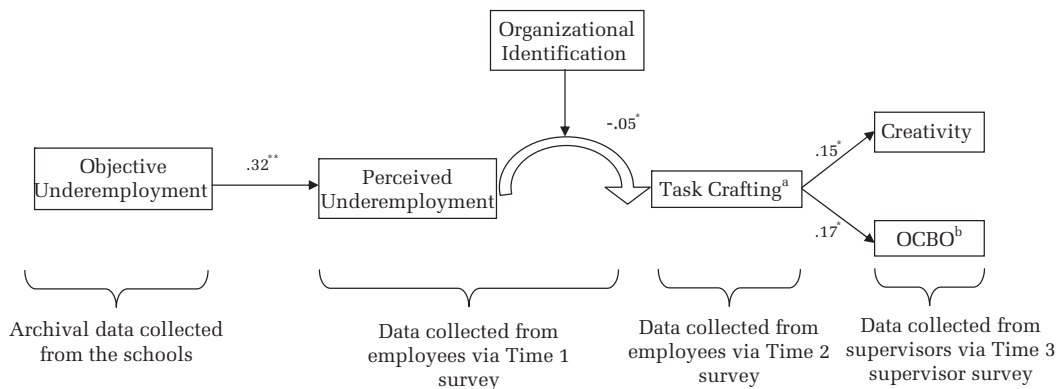
We first introduce a job-crafting perspective to provide an understanding of positive reactions to underemployment. From this theoretical perspective, we predict a curvilinear indirect effect from objective underemployment to task crafting through perceived underemployment and examine how organizational identification moderates this curvilinear relationship. Next, we analyze why task crafting may lead to creativity and OCBO, and develop a serial mediation model of the curvilinear interactive effect of perceived underemployment and organizational identification on creativity and OCBO through task crafting (see Figure 1).

#### A Job-Crafting Perspective for Understanding Positive Responses to Underemployment

We focus on task crafting as the mechanism responding to underemployment, in which objective underemployment indirectly affects employees' task

crafting through subjective underemployment. Notably, the extant literature overwhelmingly focuses on the negative outcomes of underemployment (e.g., Maynard, Joseph, & Maynard, 2006). However, more than half of prior studies have found that underemployed workers are more productive (McKee-Ryan & Harvey, 2011). A sizable body of studies has also produced results that are mixed, inconclusive, or based on small effect sizes between underemployment and various outcomes, thus suggesting the need for focused explanation (e.g., Feldman, Leana, & Bolino, 2002; Kraimer et al., 2009). We propose such an explanation: the relation between underemployment and some of its outcomes is curvilinear. Erdogan, Bauer, Peiró, and Truxillo (2011) suggested that positive consequences may occur when employees are slightly or moderately underemployed. Bashshur et al. (2011) argued that the magnitude of overqualification deserves more attention because small and large amounts of overqualification may have different consequences. Consistent with this line of thought, we reason that different studies may capture different parts of the curvilinear relation. Furthermore, although a few researchers have suggested that underemployment may lead to positive outcomes (Erdogan et al., 2011; Thompson, Shea, Sikora, Perrewé, & Ferris, 2013), few theoretical perspectives and little empirical evidence exist to

**FIGURE 1**  
Hypothesized Model, Time Points of Measurements and the Unstandardized Path Coefficients in Full Model Testing in Study 1



Note. N = 327.

⤶ = Curvilinear relationship.  
 → = Linear relationship.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

- a. We also regressed task crafting on organizational identification and control variables: age, gender, education, tenure, intrinsic and prosocial motivation.
- b. We also regressed creativity and OCBO on organizational identification, control variables, and perceived underemployment squared, perceived underemployment  $\times$  organizational identification, perceived underemployment squared  $\times$  organizational identification.

support that claim. To address this important yet under-researched issue, we integrate the job-crafting literature with the underemployment literature and posit that objective underemployment leads to perceived underemployment, which has an inverted U-shaped relation with task crafting. We first review some theoretical approaches used in prior underemployment research. As a point of departure, we formulate our new theoretical perspective—the job-crafting perspective.

Previous underemployment studies are rooted in the job design perspective and in explorations of how individuals respond to objective job characteristics (Hackman & Oldham, 1980). Advocates of this perspective implicitly treat employees' behavioral outcomes as passive reactions to the design of their jobs (Glick, Jenkins, & Gupta, 1986). Several approaches have been used under this paradigm (McKee-Ryan & Harvey, 2011). The *human capital approach* (e.g., Becker, 1993) holds that individuals make decisions about investing their human capital attained through education and training in order to obtain economic rewards. Employees' reactions are the result of a comparison between their human capital and their jobs' requirements. If they perceive underemployment, negative behaviors will follow. The *person–job fit approach* suggests that the lack of fit between employees' abilities and their job requirements results in negative outcomes (Feldman et al., 2002). The *relative deprivation approach* proposes that subjective underemployment is a feeling of deprivation that results from a comparison with referent job standards (Feldman et al., 2002). Feelings of deprivation and negative reactions may result if workers believe that they should have better jobs. The commonality of these approaches is that a job is fixed and that employee outcomes are determined by the job design (Oldham & Hackman, 2010). Negative outcomes are employees' responses to the discrepancies between fixed job requirements and personal capacity (McKee-Ryan & Harvey, 2011). These approaches have overlooked the possibility that employees can be active agents in revising their work tasks (Staw & Boettger, 1990).

We depart from these approaches and draw on the job-crafting perspective to analyze active task crafting by employees in responding to their underemployment. The job-crafting perspective views employees as active architects of their jobs who can modify their work tasks (Wrzesniewski & Dutton, 2001). Employees can do so, for example, by improving task procedures and increasing task complexity in response to the original design of the job. Using active

task crafting, employees gain a sense of agency by changing the job content to better match their own needs and aspirations (Bandura, 2001). This perspective suggests that employees are more active than depicted in the job design paradigm. The underemployed may craft their work tasks to remedy their underemployed situation.

***Objective and perceived underemployment.*** We posit that the influence of objective underemployment on task crafting is channeled by perceived underemployment. A fundamental principle is that the objective reality affects employees' behaviors through their perceptions. Employees need to perceive that they are underemployed, and through this perception, objective underemployment then indirectly affects their behavioral responses—task crafting.

The construct of underemployment typically refers to one or more tangible or observable instances of inadequate employment, such as overeducation and overexperience, and is defined as the possession of a higher capacity than is required for the job. Capacity refers to an individual's capabilities obtained via education and experience that can be productively used at work (Feldman, 1996; Johnson & Johnson, 2000). Surplus capacity refers to underutilization of the job incumbent's skills or the possession of more education and experience than the job requires (Feldman, 1996; McKee-Ryan & Harvey, 2011). For objective underemployment to affect the behaviors of the underemployed, these workers need to perceive themselves as possessing surplus capacity relative to the job requirements. In contrast to objective underemployment, perceived underemployment represents the focal employees' subjective experiences of underemployment (Feldman, 1996; McKee-Ryan & Harvey, 2011).

Although related to the construct of objective underemployment, perceived underemployment is a separate construct. Research has firmly established that employees' perceptions are influenced not only by the target of the perception but also by the employees themselves (Robbins & Judge, 2014). For a wide variety of reasons—such as limitations in information processing capabilities, the use of heuristics or shortcuts in perception and judgment, and attribution processes (Kahneman, Slovic, & Tversky, 1982; Kelley, 1967)—perceived underemployment is not exactly the same as objective underemployment. For example, employees who choose to work at a charity because of the prosocial values that the charity represents may not perceive themselves as being underemployed even if that is the objective

reality. We posit that objective underemployment may have less impact on employees' behavioral responses than perceived underemployment does, because employees' behaviors are fundamentally shaped by their perceptions. The underemployment literature has emphasized the use of perceived underemployment as the immediate predictor of employees' behaviors resulting from underemployment (Liu & Wang, 2012). Objective underemployment should lead to perceived underemployment because perceived underemployment as a psychological construct starts from the observation of objective reality (Feldman et al., 2002). The underemployment perceptions of employees should be related to their objective underemployment reality to some degree. Therefore, perceived underemployment should be the focal point linking objective underemployment to behavioral responses.

***Curvilinear relation between perceived underemployment and task crafting.*** Our model focuses on task crafting as a coping strategy used by employees as a reaction to underemployment. The coping strategy should be a logical response to employees' subjective perception of their underemployment, which is a reflection of objective underemployment. We argue that objective underemployment affects subjective underemployment and the self-image of employees.

People usually desire a positive sense of self in their own eyes (Steele, 1988) and in the eyes of others (Erez & Earley, 1993). When underemployment is perceived, an employee's positive self-image is hampered because the positive self at work is based on the self-assessment of one's capacity that is mainly reflected by the job (Erdogan & Bauer, 2009). When the employee considers the job requirements to be inferior to his or her self-assessment of capacity, the job that he or she holds renders the positive construction of the self difficult. According to Wrzesniewski and Dutton (2001), task crafting results from situations in which employees perceive that their need for a positive self-image is unfulfilled in their jobs. As a result, underemployed workers' need to assert a positive self-image drives them to craft their jobs to ensure a better fit with their preferences and competencies.

Although employees may craft their jobs in three different ways (Wrzesniewski & Dutton, 2001), the underemployed are likely to use task crafting—changing the number, scope, and procedure of job tasks—as their primary coping strategy. The other two ways are cognitive crafting—a psychological act that involves revising cues about the cognitive

interpretation of the work, and relational crafting—an action that changes the relational boundaries of the job. These are less direct ways for the underemployed to demonstrate their true capabilities above the job requirements and, hence, less effective ways to repair the damage to their self-image caused by underemployment. Task crafting is therefore the most logical and primary coping strategy used by the underemployed because employees' first choice is typically to engage in direct and overt actions to remedy the situation when they are frustrated and dissatisfied at work (Withey & Cooper, 1989).

Furthermore, task crafting is the most relevant mechanism linking perceived underemployment to creativity and OCBO—the two outcomes in our model. Underemployed individuals who engage in relational crafting may seek comfort or more interaction with people, which is unlikely to fuel the desire to be creative (Zhou & George, 2001) or the desire to go above and beyond to contribute to the organization. Likewise, although the underemployed may engage in cognitive crafting, this type of crafting may involve reinterpreting the significance of their jobs, thereby making them accept and tolerate the status quo instead of proactively attempting to engage in behaviors to change the status quo, such as actions engaging in creativity or OCBO. Overall, among the three types of job crafting, task crafting is the most logical strategy for the underemployed that would lead to creativity and OCBO. Thus, the present investigation focuses on task crafting as the mechanism linking perceived underemployment to creativity and OCBO.

Task crafting involves redesigning tasks in terms of the time and effort spent on various components of one's tasks (Berg, Dutton, & Wrzesniewski, 2013). Underemployed workers are likely to directly redesign task boundaries to display their full talents by expanding the scope of tasks; such actions may involve making tasks more complex, generating new procedures, and assuming more responsibilities in tasks. These different and more complex ways of approaching their work make underemployed workers believe that they are more capable than those who perform the same job in routine ways. As such, these task-crafting activities enhance the positive self-image of the underemployed.

Employees are likely to gauge the likelihood of successfully crafting their tasks against the risks and challenges (Wrzesniewski & Dutton, 2001). With relatively low to moderate levels of perceived underemployment, they may believe that they have enough surplus ability to tackle the challenge of

reasserting a positive self-image through task crafting. Within this range, the stronger the perception of underemployment is, the more efforts the employees would make to craft their jobs in order to achieve an equilibrium state. As the level of perceived underemployment increases, employees would find it increasingly difficult to craft their tasks to match their surplus capacity. After a certain point, the perceived large gap between their perceived surplus capacity and actual job requirements would be insurmountable in the eyes of underemployed workers. Their efforts to craft their job tasks would gradually decrease. We therefore hypothesize as follows:

*Hypothesis 1. Objective underemployment has a curvilinear indirect effect on employees' task crafting through perceived underemployment, such that objective underemployment is positively related to perceived underemployment, and subsequently, an intermediate level of perceived underemployment leads to the highest degree of task crafting.*

**Moderating role of organizational identification.**

Because self-concept is a core theoretical link between perceived underemployment and task crafting, we posit that organizational identification, which is theoretically related to self-concept, serves as a moderator of the proposed relationship. According to the job crafting model by Wrzesniewski and Dutton (2001), identity-oriented conditions affect the extent to which an employee's desire to enhance his or her positive self-image leads to task crafting. If the identity-oriented condition aligns one's actions with organizational interest, task crafting would be geared toward benefiting the organization.

Organizational identification refers to the extent to which an employee feels oneness or belongingness with respect to his or her organization and includes attributes of the organization in his or her self-definition (Dutton, Dukerich, & Harquail, 1994). Employees who strongly identify with their organization perceive oneness and common benefits with the organization (Dutton et al., 1994). Employees with high levels of organizational identification may view their organization favorably and have more positive attributions of underemployment than those with low levels of organizational identification (Tyler & Blader, 2000). When employees have high levels of organizational identification, they may view their organization favorably and attribute their underemployment to factors such as a competitive job market or inadequate display of their capacity

(Feldman et al., 2002; Kraimer et al., 2009). Employees with strong organizational identification are also more confident that their crafting efforts are considered favorable from the organization's perspective (Tyler & Blader, 2000). Organizational identification thus amplifies the positive relation between underemployment and task crafting at low to medium levels of underemployment (i.e., the left tail of the U-shaped relation) and put off the point at which employees gradually start to give up their crafting efforts. That is, the inflection point of the curvilinear path would be pushed to the top right corner when employees identify strongly with their organization. Employees with low levels of organizational identification tend to attribute their underemployment to the organization's mistreatment and quickly give up their task-crafting efforts. Hence, organizational identification may weaken the negative effect of perceived underemployment on task crafting when underemployment is high (i.e., the right tail of the inverted U-shaped relation becomes flatter), and the inflection point turning toward the downward trend may emerge later. Thus, we posit the following:

*Hypothesis 2. Organizational identification moderates the curvilinear relation between perceived underemployment and task crafting. Employees engage in more task crafting when organizational identification is high rather than low, and the inflection point of the inverted-U curve moves to the upper right corner when organizational identification is high.*

**The serial curvilinear mediated moderation model.** Thus far, we have reasoned that intermediate levels of perceived underemployment and high levels of organizational identification jointly increase task crafting. We now develop the idea that more task crafting may lead to two positive outcomes: creativity and OCBO. Creativity is the extent to which employees generate novel and useful ideas regarding products, services, and processes at work (Oldham & Cummings, 1996). Novelty reflects how a concept, an idea, or a product differs from traditional practices in a specific job or specific field; a given output is viewed as creative to the extent that appropriate observers independently agree that it is creative (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Usefulness refers to whether the ideas generated would benefit the organization; ideas that are not useful in enabling employees to do their jobs better are not considered creative (Oldham & Cummings, 1996; Zhou & Shalley, 2003). By definition, creativity differs

from task crafting in two aspects. (1) Creativity emphasizes the novelty and usefulness of a new idea for products and procedures, whereas task crafting focuses on the act of “making changes” to revise a specific task’s boundaries. These changes may be neither novel nor useful (e.g., may not benefit the organization). (2) Creativity refers to an outcome; namely, an employee successfully devises an idea, a process or a product that is both novel and useful. By contrast, task crafting emphasizes the actions and behaviors that alter the boundaries of job tasks.

When employees engage in task crafting, they redraw their task boundaries, alter the number of tasks they work on, reconfigure their work materials, redefine their tasks, rearrange their work areas, and redesign their work procedures (Leana, Appelbaum, & Shevchuk, 2009; Wrzesniewski & Dutton, 2001). The production of creative ideas requires acts of generation and exploration (Smith, Ward, & Finke, 1995). Individuals first need to generate a large number of ideas and experiment with new insights and perspectives. The nature of task crafting is likely to facilitate such creative idea generation because creativity at the behavioral level requires a “constrained stochastic process” (Simonton, 2003: 476). That is, in the process of crafting their tasks, employees may generate many ideas randomly and subsequently identify certain ideas that lead to truly creative actions. In particular, when crafting tasks, employees are likely to see their work from different and unconventional angles and perspectives, to discover new and better ways of using new social media, to stumble upon novel ways of using their work areas, and to figure out innovative and more efficient work methods and procedures (e.g., for rearranging equipment in the classroom). All of these new and better ways of doing things reflect workplace creativity (Amabile et al., 1996; Shalley et al., 2004). Consequently, we hypothesize as follows:

*Hypothesis 3a. Task crafting is positively related to employees’ creativity.*

As discussed above, task crafting peaks when underemployment is moderately high. Underemployed workers who strongly identify with their organization tend to redesign tasks in ways that use their surplus capacity to benefit the organization. One consequence of task crafting that benefits organizations is creativity. Integrating our reasoning in the current section with our earlier theorizing, we consider that an organization can benefit from perceived underemployment only to a certain degree. When employees feel that

some of their capacities surpass their job requirements to such a large degree that they cannot fully utilize their surplus capacities in their existing jobs, their job crafting diminishes, along with their creativity. Thus, we propose the following hypothesis:

*Hypothesis 3b. The curvilinear interactive effect of perceived underemployment and organizational identification indirectly affects creativity through task crafting.*

OCB represents discretionary acts that go beyond formal job descriptions and contribute to the success of the organization (Organ, 1997). Behavior that targets the organization as a whole is called OCBO (Williams & Anderson, 1991). We expect the task crafting of the underemployed to lead to OCBO. Task crafting, by definition, represents employees’ attempts to expand, change, and redesign their task boundaries (Wrzesniewski & Dutton, 2001). To enhance positive self-image by demonstrating their surplus capacity, the underemployed may choose crafting actions that broaden task boundaries and thus contribute to their organization. Expanding their job scope and adding more challenging tasks requires underemployed workers to use their surplus capacity and thus elevates their tasks to the level of self-evaluation of competency. For example, programmers who view themselves as overqualified and strongly identify with their organization may take on complex assignments for the organization. Because these tasks provide room for programmers to redesign their workflow to rapidly progress and enhance products, crafting these tasks enables programmers to exhibit their full potential. When crafting tasks in this way, underemployed programmers do extra work to boost quality and productivity for the organization—they perform more OCBO (Organ, 1988). Further, OCBO targets the effectiveness of the organization itself (Williams & Anderson, 1991). Thus, when the underemployed craft tasks, they engage in OCBO.

*Hypothesis 4a. Task crafting is positively related to employees’ OCBO.*

Similar to this rationale, in Hypothesis 4b, we integrate our theorizing in the current section with our earlier arguments and suggest that task crafting represents the curvilinear joint effect of perceived underemployment and organizational identification that produces OCBO. When employees feel that some of their capacities surpass their job requirements to such a large degree that they cannot fully utilize their surplus capacities in their existing jobs,

their job crafting diminishes, as will their OCBO. Thus, we hypothesize as follows:

*Hypothesis 4b. The curvilinear interactive effect of perceived underemployment and organizational identification indirectly affects OCBO through task crafting.*

Given that objective underemployment indirectly influences task crafting through perceived underemployment (Hypothesis 1), all hypothesized paths actually formulate a serial indirect effect chain to predict two outcomes: creativity and OCBO. Although we focus on the interactive curvilinear effects of perceived underemployment, objective underemployment is often considered as a distal predictor of personal reactions (Lukseyte & Spitzmueller, 2011). Thus, we posit the following:

*Hypothesis 5. The effect of objective underemployment on creativity and OCBO is sequentially mediated by (a) perceived underemployment and (b) task crafting; task crafting conveys the curvilinear interactive effect of perceived underemployment and organizational identification to creativity and OCBO.*

Finally, because underemployed individuals would engage in OCBO or creative behavior if they are motivated by the good feelings they get from the work (intrinsic motivation) or by their willingness to contribute to society (prosocial motivation), we included these motivations as control variables in our model to partial out their potential effects.

## STUDY 1: METHODS

### Sample and Research Setting

We tested our hypotheses with a sample of teachers in six high schools of an educational institution in China. All six schools were comparable in their size and reputation. High school teachers in China are appropriate for the study of perceived underemployment and task crafting for two reasons. First, the minimum qualification of high school teachers in China is an associate degree from a three-year community college. However, many high school teachers are four-year university graduates due to labor market conditions. In our sample, approximately 60% of the teachers had community college certificates and the other 40% had university or higher degrees. Second, teaching jobs are suitable for studying task crafting. Unlike teachers in the West, Chinese high school teachers can minimize

their workload by only giving monotonic lectures according to the syllabi set by the Education Ministry. They can also expand their job content extensively by adding special activities to stimulate students' interests and motivation. For example, teachers can change the set-ups of the classroom to organize activities, or redesign teaching procedures. We confirmed with principals of the schools that these activities were considered as task crafting in China. By definition, creativity differs from task crafting in that creativity focuses on the outcome—the novel and useful ideas generated; whereas task crafting focuses on the behavioral actions that revise the task boundaries. Supervisors of the teachers provided the following examples of teachers' creativity: (a) the teachers frequently communicated with students and parents using WeChat (a Chinese app that is similar to Whatsapp); (b) the teachers uploaded and commented on students' activities, e.g., celebrations, debates in classroom, and accepting some awards, on the school-family sharing platform. The supervisors of the teachers are responsible for monitoring and supervising five to 10 teachers in one grade. They often conduct class inspections and collect feedback from students and their parents in order to assess the performance of teachers. Through the help of the head of the institution and the school principals, we invited teachers in various grades to participate in the study. The human resources manager provided a list of the participants' names and their demographic information, such as gender, age, education, and tenure.

### Procedure

Data were collected from the teachers and their supervisors in a time-lagged design at three time points. At Time 1 (T1), teachers were asked to rate their perceived underemployment, organizational identification, intrinsic motivation, and prosocial motivation. One week later (T2), they reported their task crafting. One week after T2, ratings of the creativity and OCBO of teachers were obtained from their supervisors at Time 3 (T3). We chose one week as the time lag interval because our model deals with a psychological process and its effects on employee discretionary outcomes. The supervisors assessed the creativity and OCBO of their subordinates over the study week. When an employee perceived underemployment, it may have started to generate psychological effects on behaviors because teachers can engage in task crafting inside the classroom at any time they want. Creativity and OCBO (T3) could



result while the employees engage in task crafting (T2) every day; these behavioral outcomes are not like job performance, which requires the accumulation of task completion over a longer time span. We used an online survey system to match the participants' data while keeping the respondents anonymous. A gift of about five U.S. dollars was given to each participant after they finished the survey.

A total of 426 teachers and 86 supervisors participated (equal to 87.22% of the 587 invited to take part in). After deleting unmatched data across the three surveys, our final sample included 327 teachers and 85 supervisors, with a response rate of 76.76% for teachers and 98.83% for supervisors. Among the teachers, 87 were men and 240 were women. Their mean age was 29 ( $SD = 7.26$ ) and average organization tenure was 4.90 years ( $SD = 1.33$ ). The median post-high-school education of the teachers was four years. There was no significant difference in the age, gender, education, and organizational tenure of the teachers. If there was any pattern of attrition by teachers that was correlated with the study variables during the two waves (T1 and T2) of data collection, our findings may have been biased. Thus, we examined a dummy variable that denoted the teachers who withdrew between T1 and T2. We observed a negligible correlation ( $.02$ ,  $p > .05$ ) between the dummy variable and our study variables. This showed that participant attrition during data collection was random.

## Measures

Unless otherwise noted, seven-point Likert-type scales ranging from 1 ("strongly disagree") to 7 ("strongly agree") were used. Items related to perceived underemployment, organizational identification, task crafting, intrinsic motivation, and prosocial motivation were translated into Chinese using the standard translation-back translation procedure (Brislin, 1986). Table 1 shows the internal consistency reliabilities for the measures.

**Objective underemployment.** Objective underemployment is defined as a teacher possessing higher qualifications than required by his or her position. We presented this definition to the school principals, our subject matter experts, and asked them for suggestions for an operationalization of objective underemployment. According to them, qualifications and job requirements of teachers in their schools are best represented by a combination of education and work experience. There are two kinds of teachers in the Chinese high school

education system: class teachers and course teachers. Class teachers have a lower teaching load, but are responsible for the administrative and student affairs for a designated class. This position requires teachers to have either (1) a four-year university degree plus at least two years of teaching experience, or (2) an associate degree from a community college plus at least four years of teaching experience. Course teachers are only responsible for teaching, with no administrative duties. This position requires teachers to have a minimum of an associate degree from a community college, with no requirements for teaching experience. These requirements are well-known to all teachers in their schools. Teachers who possessed a higher education or level of experience required by their job position would fit our definition of objective underemployment. Thus, class teachers were coded as objectively underemployed by a dummy variable (objective underemployment = 1) if (1) they had a university degree or higher plus more than two years of teaching experience, or (2) they had an associate degree plus more than four years of teaching experience. Course teachers were coded as objectively underemployed (objective underemployment = 1) if (1) they had a university degree or higher, or (2) they had an associate degree plus more than one year of experience. The rest of the teachers were coded as just-employed (objective underemployment = 0).

**Perceived underemployment.** Teachers responded to four items measuring perceived underemployment (Erdogan & Bauer, 2009). A sample item is, "Based on my skills, I am overqualified for the job I hold."

**Organizational identification.** Mael and Ashforth's (1992) organizational identification scale was used to measure organizational identification. The teachers were asked to assess whether they perceived "oneness" with their schools. A sample item is, "When someone praises my school, it feels like a personal compliment."

**Task crafting.** Six items adapted from Leana et al. (2009) were used to measure task crafting. Teachers were asked to indicate the frequency with which they engaged in the six crafting behaviors (1 = "never," 7 = "very often"). A sample item is "rear-range equipment or furniture in the activity areas of [their] classrooms." In choosing measurement scales for this study, we consulted principals and teachers at the schools. They informed us that the items measuring task crafting developed by Leana et al. (2009) were highly appropriate for their teachers. Since teachers in China usually conduct straightforward

TABLE 1  
Means, Standard Deviations, Correlations, and Reliability Coefficients for Variables in Study 1

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender <sup>a</sup>	1.73	.24												
2. Age	29.05	7.26	-0.34**											
3. Education <sup>b</sup>	3.37	0.54	-0.02	-0.13*										
4. Organization tenure	4.90	1.33	-0.22**	0.42**	-0.23**									
5. Objective underemployment <sup>c</sup>	0.49	0.33	-0.07	-0.10	0.61**	-0.13*								
6. T1 perceived underemployment	4.77	1.09	-0.02	0.16**	0.03	0.07	0.21**	(0.89)						
7. T1 organizational identification	4.95	1.27	0.05	-0.06	-0.24**	0.13*	-0.12*	0.12*	(0.91)					
8. T2 task crafting	4.09	0.89	0.08	0.04	-0.12*	0.16**	-0.00	0.33**	0.34**	(0.82)				
9. T2 prosocial motivation	5.28	1.10	0.05	-0.15**	-0.08	0.04	-0.07	0.02	0.46**	0.35**	(0.91)			
10. T2 intrinsic motivation	4.61	1.30	0.14**	0.04	-0.17**	0.10	-0.14**	-0.04	0.39**	0.20**	0.35**	(0.89)		
11. T3 creativity	4.52	1.22	0.04	-0.02	-0.11*	0.15**	-0.03	-0.04	0.12*	0.15**	0.16*	0.07	(0.87)	
12. T3 OCBO	4.84	1.27	0.10	-0.01	-0.17**	-0.04	0.08	0.06	0.28**	0.24**	0.15**	0.44**	0.08	(0.78)

Notes:  $n = 327$ . Internal consistency reliabilities appear in parentheses along the diagonal.

<sup>a</sup> 1 = male, 2 = female.

<sup>b</sup> 1 = primary school, 2 = high school, 3 = college certificate degree, 4 = bachelor's degree, 5 = master's degree, 6 = doctoral degree.

<sup>c</sup> 0 = just-employment, 1 = underemployment

\*  $p < .05$ , \*\*  $p < .01$ .

lectures and test students on their memory of the content knowledge, Leana et al.'s items fit the conceptual definition of task crafting well.

**Creativity.** We used Shin, Kim, Lee, and Bian's (2012) validated Chinese version of the creativity measure that was originally developed by Zhou and George (2001). Supervisors rated the teachers' creativity using 13 items. A sample item is "Comes up with creative solutions to problems." We informed the supervisors of the definition of creativity.

**OCBO.** Supervisors assessed each teacher's OCBO using four items that were previously validated by Lin and Peng (2010) using Chinese samples. We replaced the word "employees" in the original items with "teachers." A sample item is, "This teacher does not mind taking on new or challenging assignments."

**Control variables.** We controlled for age, gender, education, and organizational tenure in our analysis because they may influence task crafting. For example, teachers with more experience might have a greater understanding of their students, which may enhance their confidence in crafting teaching content. We also controlled for *prosocial* and *intrinsic motivations* using items adapted from self-regulation scales developed by Ryan and Deci (2000). An introductory question asked, "Why are you motivated to do your work?" The surveys contained four items measuring each type of motivation. A sample item for prosocial motivation is, "Because I care about benefiting others through my work," and a sample item for intrinsic motivation is "Because I enjoy the work itself."

### Analytical Approach

Because teachers were nested within supervisors, we used multilevel modeling (Raudenbush & Bryk, 2002) to test our hypotheses. We used the multilevel module of Mplus 7.0 software (Muthén & Muthén, 2007), which can accommodate individual effects (level 1) and supervisor effects (level 2) simultaneously. Perceived underemployment, task crafting, organizational identification, creativity, and OCBO were individual-level (level 1) variables. All the predictor variables are grand-mean-centered (Hofmann, Griffin, & Gavin, 2000).

Our model involves testing the serial and nonlinear mediation effects from objective underemployment to creativity and OCBO with task crafting as a mediator. Hayes and Preacher (2010) introduced a procedure to analyze nonlinear mediation effects. Preacher, Rucker, and Hayes (2007) and Hayes

(2013) suggested models for testing mediated moderation and serial multiple mediation. Mell, van Knippenberg, and van Ginkel (2014) combined Preacher et al.'s (2007) and Hayes' (2013) procedures to test a serial mediated moderation model. Following prior works and considering the fact that our hypotheses involve mediated moderation with nonlinear effects and serial mediation, we combined and modified these procedures and derived the serial nonlinear mediated moderation estimation statistics,  $\theta$ , to test our hypotheses. Specially, we used regression analysis with quadratic terms to test the inverted U-shaped relationship between perceived underemployment and task crafting in Hypothesis 1:

$$\begin{aligned} \text{Task crafting} = & \gamma_{00} + \gamma_{c0}(\text{controls}) \\ & + \gamma_{10}(\text{perceived underemployment}) \\ & + \gamma_{20}(\text{perceived underemployment squared}) \quad (1) \end{aligned}$$

Because the explanatory variables in our analysis were grand-mean-centered,  $\gamma_{20}$  had to be negative and significant to indicate the presence of an inverted U-shaped relationship between perceived underemployment and task crafting. Next, we used the following equation to test the moderating effect of organizational identification proposed in Hypothesis 2:

$$\begin{aligned} \text{Task crafting} = & \gamma_{00} + \gamma_{c0}(\text{controls}) \\ & + \gamma_{10}(\text{perceived underemployment}) \\ & + \gamma_{20}(\text{perceived underemployment squared}) \\ & + \gamma_{30}(\text{organizational identification}) \\ & + \gamma_{40}(\text{organizational identification} \\ & \quad \times \text{perceived underemployment}) \\ & + \gamma_{50}(\text{organizational identification} \\ & \quad \times \text{perceived underemployment squared}) \quad (2) \end{aligned}$$

In Equation (2), significance for  $\gamma_{50}$  would indicate that the inverted U-shaped relationship between perceived underemployment and task crafting would vary as a function of organizational identification.

Hypothesis 3 addressed the curvilinear mediated moderation effect of task crafting. According to Hayes and Preacher (2010), a curvilinear mediation effect is a special case of a more general expression of an indirect effect in which an independent variable ( $X$ ) is nonlinearly related to a mediator ( $Me$ ), and in turn linearly associated with a dependent variable ( $Y$ ). In its most general form, the rate at which a change in  $X$  changes  $Y$  indirectly through changes in  $Me$ , denoted here as  $\theta$ , can be estimated as the product of the first

partial derivative of the function of  $Me$  with respect to  $X$  and the first partial derivative of the function of  $Y$  with respect to  $Me$ :

$$\theta = \frac{\partial Me}{\partial X} \frac{\partial Y}{\partial Me} \quad (3)$$

To calculate the instantaneous indirect effect in our study, we substituted perceived underemployment for  $X$ , task crafting for  $Me$ , and OCBO (or creativity) for  $Y$ . According to our theorization, task crafting is linearly related to OCBO:

$$OCBO = \gamma_{60} + \gamma_{70}(\text{task crafting}) + \text{error} \quad (4)$$

Next, we derived the partial derivative of task crafting with respect to perceived underemployment from Equation (2) and the partial derivative of OCBO with respect to task crafting from Equation (4):

$$\begin{aligned} \frac{\partial Me}{\partial X} &= \gamma_{10} + \gamma_{40}(\text{organizational identification}) \\ &+ 2\gamma_{20} + 2\gamma_{50}(\text{organizational identification} \\ &\quad \times \text{perceived underemployment}) \end{aligned} \quad (5)$$

According to Equation (3) and  $\frac{\partial Y}{\partial Me} = \gamma_{70}$ , the instantaneous indirect effect of perceived underemployment–organizational identification on OCBO through task crafting is:

$$\begin{aligned} \theta &= [\gamma_{10} + \gamma_{40}(\text{organizational identification}) + 2\gamma_{20} \\ &+ 2\gamma_{50}(\text{organizational identification} \\ &\quad \times \text{perceived underemployment})] \gamma_{70} \end{aligned} \quad (6)$$

In Equation (6),  $\theta$  is not a constant, but a linear function of the product term (*perceived underemployment*  $\times$  *organizational identification*) and *organizational identification*. Mathematically, if the difference in  $\theta$  at low versus high levels of perceived underemployment and organizational identification is significantly different from zero, the hypothesized curvilinear mediated moderation effect of task crafting is supported. For example, the difference in  $\theta$  at high and low levels of perceived underemployment for teachers with high levels of organizational identification should be significantly different for those with low levels of organizational identification. In the case involving OCBO as  $Y$  for deriving Equation (6), the significant difference (95% confidence interval does not include zero) among the estimates of  $\theta$  in conditions of the specific values of these two variables presents support for Hypothesis 4b. The same is true for Hypothesis 3b regarding the other dependent variable, creativity.

## STUDY 1: RESULTS AND DISCUSSION

### Preliminary Analysis

Table 1 shows the means, standard deviations, reliabilities, and correlations. Prior to testing our hypotheses, we performed a confirmatory factor analysis (CFA) to assess the quality of our survey measures, including perceived underemployment, task crafting, organizational identification, and intrinsic and prosocial motivation. The CFA showed satisfactory fit, with a CFI of .94 and an RMSEA of .05. Next, given that each supervisor rated multiple teachers, we examined supervisory ratings for nonindependence. A one-way random analysis of the variance of the two outcome variables showed that the variances in supervisor-level means of creativity,  $F(83, 326) = 18.03, p < .01$  and OCBO,  $F(83, 326) = 8.53, p < .01$  were significant. ICC(1) for creativity and OCBO were .74 and .55, respectively. Thus, there were substantial variances in the outcome variables, warranting the use of multilevel modeling to analyze the data.

### Hypothesis Testing

Hypothesis 1 stated that objective underemployment indirectly affected task crafting through the curvilinear relationship between perceived underemployment and task crafting. In this indirect effect chain, the path from objective underemployment to perceived underemployment is positive and linear. In the full model, the path from objective underemployment to perceived underemployment was significant ( $b = .32, p < .01$ ; Figure 1). Hypothesis 1 was supported. The subsequent path proposed in Hypothesis 1 is the inverted U-shaped relation between perceived underemployment and task crafting. We regressed task crafting on perceived underemployment and its squared term. Table 2 shows that the curvilinear relation was statistically significant ( $\gamma_{20} = -.08, p < .05$ ). The relationship between perceived underemployment and task crafting showed an upward trend at lower levels of perceived underemployment and a downward trend at higher levels of perceived underemployment. As depicted in Figure 2, the shape of the relation is consistent with Hypothesis 1. We calculated the inflection point following Aiken and West's (1991) approach, and found that the inflection point of perceived underemployment was 4.97. If perceived underemployment was lower than 4.97 within the seven-point scale, the trend of

**TABLE 2**  
**Results of Hierarchical Linear Modeling-Based Regression Analysis of Study 1**

Variables		T2 Task Crafting				$\Delta R^2$	
		<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>		
Step 1	Intercept	4.65**	0.65	7.15	0.00	0.04	
	Gender	0.24	0.14	1.68	0.09		
	Age	0.01	0.01	0.87	0.38		
	Education	-0.16	0.11	-1.42	0.16		
	Organization tenure	0.11*	0.05	2.10	0.04		
Step 2	Intercept	3.57**	0.61	5.84	0.00	0.04*	
	Gender ( $\gamma_{c10}$ )	0.17	0.13	1.29	0.20		
	Age ( $\gamma_{c20}$ )	0.00	0.01	-0.16	0.87		
	Education ( $\gamma_{c30}$ )	-0.09	0.11	-0.81	0.42		
	Organization tenure ( $\gamma_{c40}$ )	0.09	0.05	1.96	0.05		
	T1 perceived underemployment (UE)	0.28**	0.05	5.38	0.00		
Step 3	Intercept	3.72**	0.61	6.08	0.00	0.07*	
	Gender	0.13	0.13	0.95	0.35		
	Age	0.00	0.01	-0.28	0.78		
	Education	-0.06	0.11	-0.55	0.58		
	Organization tenure	0.09	0.05	1.95	0.05		
	T1 UE ( $\gamma_{10}$ )	0.27**	0.05	5.21	0.00		
	T1 UE squared ( $\gamma_{20}$ )	-0.08*	0.04	-2.24	0.03		
Step 4	Intercept	3.72**	0.61	6.13	0.00		0.10**
	Gender	0.08	0.13	0.62	0.53		
	Age	0.00	0.01	-0.39	0.70		
	Education	-0.04	0.11	-0.34	0.74		
	Organization tenure	0.10*	0.05	2.11	0.04		
	T1 UE	0.27**	0.05	5.29	0.00		
	T1 UE squared	-0.08*	0.04	-2.14	0.03		
	T1 organizational identification (OI) ( $\gamma_{30}$ )	1.08**	0.25	4.31	0.00		
	T1 UE $\times$ T1 OI ( $\gamma_{40}$ )	-0.14**	0.05	-2.84	0.01		
	T1 UE squared $\times$ T1 OI ( $\gamma_{50}$ )	-0.07*	0.03	-2.12	0.04		
$R^2$ for total equation						0.29**	

Notes:  $n = 327$ . Unstandardized coefficients are reported. The  $\Delta R^2$  values indicate the percentage of explainable level 1 variance in the dependent variables accounted for by each step. UE = perceived underemployment, OI = organizational identification.

\*  $p < .05$

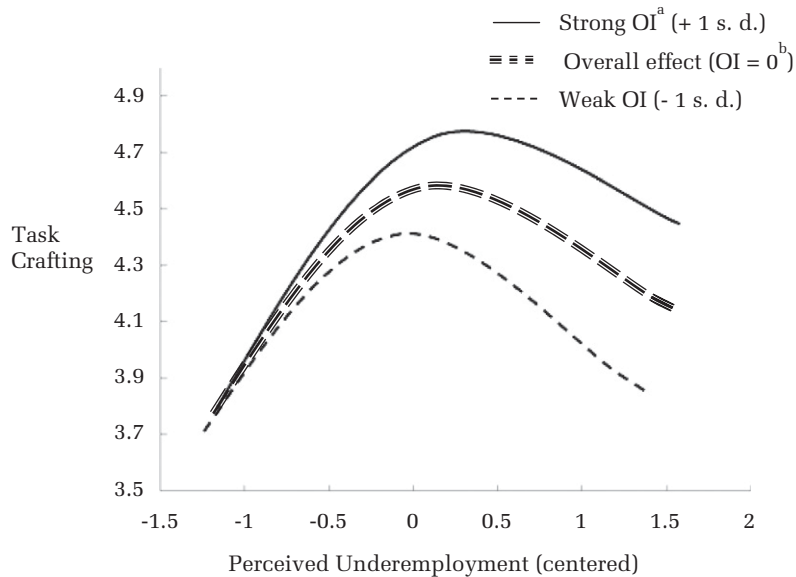
\*\*  $p < .01$

the relation with task crafting was upward. It turned downward when perceived underemployment was larger than 4.97. Using a *t*-test, we found significant differences between the slopes of the simple main effects before and after the inflection point ( $t = 3.80$ ,  $p < .01$ ). The curvilinear path of the indirect effect of Hypothesis 1 was supported.

We further tested this curvilinear indirect effect based on Hayes and Preacher's procedure (2010: 633). The curvilinear mediation effect of perceived underemployment is represented by the parameter  $\theta$ . Because  $\theta$  is not a constant but a linear function of

perceived underemployment, the curvilinear mediation effect size is reflected by the difference in  $\theta$  for high and low values (two standard deviations above and below the mean) of perceived underemployment. The  $\theta$  for high and low perceived underemployment were  $-.211$  and  $-.099$ , respectively. The difference of the two  $\theta$  estimates was  $.112$  (confidence interval =  $[.026, .378]$ ), indicating that perceived underemployment conveys the indirect effect of objective underemployment on task crafting with the curvilinear path from perceived underemployment to task crafting. Hypothesis 1 was supported.

**FIGURE 2**  
**Relationship between Perceived Underemployment and Task Crafting as a Function of Organizational Identification in Study 1**



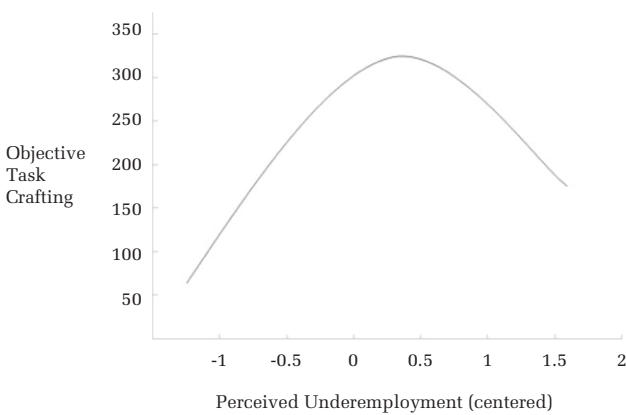
Note. a. OI = organizational identification.  
 b. Data of organizational identification are grand-mean-centered.

Hypothesis 2 predicted that organizational identification moderated the relation between perceived underemployment and task crafting. To test this hypothesis, we introduced the product terms between organizational identification and underemployment and that between organizational identification and underemployment-squared into the analysis. The results indicated that organizational identification significantly interacted with perceived underemployment-squared to influence task crafting ( $\gamma_{50} = -.07, p < .05$ ). To show the pattern of this interactive effect, we plotted the simple main effects in Figure 2 according to Cohen, Cohen, West, and Aiken's (2003) procedure. Figure 2 shows that the point of inflection of the inverted U-shaped relation between perceived underemployment and task crafting shifted vertically as a function of organizational identification. Consistent with Hypothesis 2, organizational identification amplified the effect of perceived underemployment on task crafting. Based on our theorization, the relation between perceived underemployment and task crafting would become negative because the room of using task crafting as a psychological mechanism to deal with perceived underemployment becomes smaller as perceived

underemployment increases. For employees who highly identified with the organization, they would still try their best to contribute by crafting their tasks. As a result, organizational identification would reduce the negative effect of perceived underemployment on task crafting when underemployment was high. Since the inverted U-shaped relation between perceived underemployment and task crafting was stronger for employees with higher levels of organizational identification (see the upper curve in Figure 2), Hypothesis 2 was supported.

Hypotheses 3 and 4 involved the curvilinear mediated moderation effects of task crafting on creativity (H3b) and OCBO (H4b). Combining Hypothesis 1 with Hypothesis 4 forms a serial curvilinear mediated moderation model. We tested Hypotheses 3 and 4 using the path coefficients estimated from this serial curvilinear mediated moderation model. We included all control variables, objective underemployment as the predictor of perceived underemployment, task crafting as the mediator between the interactive curvilinear effect of perceived underemployment and organizational identification, and two outcomes (creativity and OCBO) at the same time in the path analysis. As

**FIGURE 3**  
**Relationship between Perceived Underemployment**  
**and Objective Task Crafting in Study 2**



shown in Figure 1, the interactive curvilinear effect of perceived underemployment and organizational identification had a negative relation with task crafting ( $b = -.05, p < .05$ ). Task crafting was significantly related to creativity ( $b = .15, p < .05$ ) and OCBO ( $b = .17, p < .05$ ). Hypotheses 3a and 4a were supported.

To calculate the curvilinear indirect effects for Hypotheses 3b and 4b, we multiplied the effect size of the interaction of perceived underemployment-squared and organizational identification on task crafting by the effect of task crafting on creativity and OCBO. The differences in  $\theta$  for low perceived underemployment when organizational identification is low versus high when creativity was the outcome variable was .261 (confidence interval = [.044, .438]). Similarly, the difference in  $\theta$  for high perceived underemployment when organizational identification was low versus high when creativity was the outcome variable was .987 (confidence interval = [.621, 1.207]). The confidence interval for the two difference scores was  $-.726$  [-.891,  $-.422$ ], which did not contain zero. This result showed that the moderating effect of organizational identification on the underemployment-creativity relation conveyed by task crafting depended on the value of underemployment, indicating a curvilinear mediated moderation effect. In short, organizational identification moderated the curvilinear effects of underemployment on creativity through task crafting as an intervening variable. Hypothesis 3b was supported. A parallel analysis for OCBO with that for creativity showed that the difference in  $\theta$  at low versus high perceived underemployment and organizational identification was  $-.824$  (confidence

interval = [-1.029,  $-.322$ ]). The results showed that organizational identification moderated the quadratic effects of underemployment on OCBO through task crafting as an intervening variable. Hypothesis 4b was supported.

Hypothesis 5 predicted a serial curvilinear indirect effect from objective underemployment to perceived underemployment squared  $\times$  organizational identification to task crafting and finally to creativity and OCBO. The test of this serial indirect effect consists of the product of the paths (1) from objective to perceived underemployment ( $b = .32, p < .01$ ), (2) from the interaction term (perceived underemployment squared  $\times$  organizational identification) to task crafting ( $b = -.05, p < .05$ ), (3) from task crafting to creativity ( $b = .15, p < .05$ ) / OCBO ( $b = .17, p < .05$ ) (see Figure 1). For the serial indirect effect via task crafting to predict creativity, the overall effect size was  $-.141$  with a confidence interval of [-.291,  $-.011$ ]. For the serial indirect effect via task crafting to predict OCBO, the overall effect size was  $-.160$  with a confidence interval of [-.312,  $-.026$ ]. Thus, the results supported the serial curvilinear mediated moderation from objective underemployment to creativity and OCBO via underemployment perceptions and task crafting. Hypothesis 5 was supported.

## Discussion

While Study 1 provided support for our hypotheses, it was conducted in schools with the majority of the sample being female teachers. Study 1 was one of the few studies to have directly examined the relation between objective and perceived underemployment, as well as the curvilinear indirect relation between underemployment and task crafting. We tried to replicate our results with a different sample in a different setting. Based on the triangulation approach in research design (Denzin, 2006), we tried to replicate our results on the causal chain from objective to task crafting through perceived underemployment by operationalizing these key variables in different ways in Study 2. First, Study 2 was conducted in a manufacturing setting in which a majority of the sample was male. Second, in Study 2 we operationalized underemployment by using the skill levels of the workers. This operationalization allows the workers to focus on underemployment in terms of skill, regardless of outside options in the job market. Third, we used an objective method to operationalize task crafting in Study 2.

## STUDY 2: METHODS

Study 2 provided additional validity evidence for the effect of objective underemployment on task crafting through perceived underemployment in a number of ways. First, we operationalized the extent to which employees were underemployed through a training task of assembling component parts of a helicopter model. This allowed us to obtain an independent and objective measure of the degree of underemployment or overqualification for a task. Second, we measured the extent to which employees crafted their task using an objective measure. Third, we conducted this study using a sample of technicians in an electronic equipment factory.

### Sample and Research Setting

The participants comprised 297 technicians in an electronic equipment factory in China. All participants had graduated from electronic technical schools and were working on similar tasks at the same organizational level. Their daily job was to assemble electronic toys with medium complexity into finished or semi-finished products. The average age of the technicians was 24; 27% of them were female. Their average tenure in the factory was 4.14 years.

The research setting was a training workshop run by the factory. To operationalize underemployment and task crafting in a meaningful and realistic way, we worked with a panel of three subject matter experts (SMEs): two senior technicians and the production director of the factory. We provided them with the definitions of underemployment and task crafting, and extensively discussed with them how to operationalize the variables. Finally, we identified two key components in task crafting behavior, (1) altering task boundaries (number, scope, or procedure), (2) self-driven behaviors (Wrzesniewski & Dutton, 2001: 185, 188) to design corresponding operationalization task. A training exercise was suggested as an appropriate context for testing our hypotheses.

### Procedure

The training exercise included five steps. (1) Upon arrival at the factory, each worker received a sticker with a random code and was asked to fill out a survey on their demographic information. (2) Workers were

then asked to complete a helicopter exercise as a measure of their degree of underemployment or overqualification. They were asked to reproduce a helicopter model shown on the screen using component pieces with a similar degree of complexity within eight minutes. The component pieces were similar parts with different colors and assemble structures. The workers were asked to reproduce the exact helicopter model shown on the screen in all aspects, such as color, shape, and functionality. The SMEs designed this simulation task so that it had similar degrees of complexity to the usual task that these workers carried out in their real work setting. The training instructor stressed that the workers were expected to try their best to finish the task. (3) After eight minutes, workers were asked to take a rest. The researchers counted the number of component pieces bolted by each worker and wrote down the number on a piece of paper next to each helicopter model.

When the workers returned after the rest, they were asked to check the number of component pieces of the helicopter they had accomplished. The workers were informed of three things: (1) the eight minutes was set for finishing half of the model because the helicopter was supposed to be finished in 16 minutes in our trial test runs; (2) they could consider themselves overqualified if they could finish more than 46 out of a total of 92 pieces of the helicopter model; (3) the more pieces of blocks beyond 46 they used, the higher would be their degree of overqualification for this task. Workers were then asked to fill out a survey measuring perceived underemployment regarding the assembly tasks. Next, they were given another assembly task. The SMEs developed this task-crafting exercise according to the task-crafting definition and examples described by Berg, Grant, and Johnson (2010) and Berg et al. (2013). In this exercise, workers were asked to design and assemble one simple model of a boat with an unlimited supply of component pieces in 30 minutes. We showed a simple boat model as a reference on the screen. The workers were informed that they could design the boat model(s) in any way and their performance would be recorded when it was completed. The basic requirement for this exercise was that each worker had to produce at least one boat model using the sample shown on the screen as an example. The task would be considered completed regardless of how simple or complex the boat was, how many boat models the workers produced, or how long they spent on the exercise so long as it was less than 30 minutes.



After finishing their task, each worker pasted their randomly assigned code number on their boat model(s) as identification and was dismissed. After all workers had left, we calculated the scores of the boat assembling task.

### Measures

**Objective underemployment.** The helicopter exercise was designed to measure the degree of overqualification of the workers in finishing assembly tasks similar to those in their work setting. In a pilot test, the three SMEs determined that eight minutes was the optimal time limit of this helicopter exercise because most workers would finish more than one half of the helicopter, but almost none could finish the whole model in eight minutes. Since the helicopter model consisted of 92 component pieces of a similar degree of difficulty, we operationalize objective underemployment (or overqualification in terms of skills) of a worker as the number of component pieces of the helicopter model a worker can bolt together above 46 pieces, i.e., one half of the final model. For example, the degree of underemployment of a worker who finished 57 pieces of the helicopter model in eight minutes was 57 minus 46, or 11.

**Perceived underemployment.** We used the same scale as in Study 1, except that the items were modified to refer to the assembly task. A sample item is, "Based on my skills, I am overqualified for the task I am doing." The Cronbach's  $\alpha$  of these four items was .71.

**Task crafting.** The sample shown on the screen in the boat exercise was carefully designed by the three SMEs. They developed it to match the degree of complexity of the usual work tasks of the workers. It consisted of 30 component pieces. According to the SMEs, this is the minimum number of components required to build a boat of a similar degree of complexity. The boat shown on the screen was used as an

example and set the *task boundary* of the complexity required for one simple boat for the workers. If the workers used *more* than 30 pieces and assembled boats in *different patterns*, they were considered to have changed the number (of boats) and the scope (complexity of the boats) of the tasks. The effort expended indicated that they did not passively accept the exogenous requirement. Instead, they initiated some new tasks. Thus, the excess number of parts reflects the degree of self-driven effort for altering task boundary, i.e., task crafting. Based on this logic, we operationalize task crafting as the number of components over 30 pieces that a worker used to build his or her boat(s), where the more pieces over 30, the higher the task-crafting score. For example, if a worker's boat had 88 pieces, the degree of task crafting of this worker was 58.

### STUDY 2: RESULTS

Table 3 shows the descriptive statistics. The minimum underemployment score was 11 and the maximum was 43. The scores of task crafting ranged from 6 to 316 (component pieces). Hypothesis 1 predicted that objective underemployment positively leads to perceived underemployment and subsequently has a curvilinear relation with task crafting. First, we found a significant correlation between objective and perceived underemployment ( $r = .16, p < .05$ ; Table 3). Regressing perceived underemployment on tenure and objective underemployment, the path from objective underemployment to perceived underemployment was significant ( $b = .22, p < .01$ ). To test whether perceived underemployment had an inverted U-shaped relation with task crafting, we standardized tenure, objective underemployment, perceived underemployment, and squared perceived underemployment and entered them one by one into the regression analysis to predict task crafting. We controlled for tenure because it affects how skillful the workers are in

TABLE 3  
Means, Standard Deviations, and Correlation Coefficients for Variables in Study 2

	Mean	SD	Min.	Max.	1	2	3
1. Organization tenure	4.14	2.31	1	8			
2. Objective underemployment	27.43	10.11	11	43	-0.17**		
3. Perceived underemployment	4.39	1.09	1.75	6.25	0.41**	0.16**	
4. Objective task crafting	99.51	41.36	6	316	-0.33**	0.42**	-0.14

Notes:  $n = 297$ .

\*\*  $p < .01$

designing the boat. The hierarchical regression results showed that the association between squared perceived underemployment and task crafting was statistically significant ( $b = -.26, p < .05$ ). As Figure 3 shows, objective task crafting increased at low levels and decreased at high levels of perceived underemployment.

Hypothesis 1 suggested a curvilinear indirect effect from objective underemployment to task crafting through perceived underemployment. We tested this curvilinear indirect effect based on Hayes and Preacher's procedure (2010). The curvilinear mediation effect,  $\theta$ , is reflected by the difference of the  $\theta$  for high and low values of perceived underemployment. The difference of the two  $\theta$  estimates was  $-.249$ , with a confidence interval of  $[-.516, -.097]$ . Hypothesis 1 was supported again in Study 2.

## GENERAL DISCUSSION

We examined the curvilinear mediated moderation effect of task crafting on the joint effect of perceived underemployment and organizational identification on creativity and OCBO. In Study 1, multisourced data collected from teachers in three waves provided support for our hypotheses. The relation between perceived underemployment and task crafting followed an inverted U-shaped relation. Task crafting levels were higher at intermediate levels than at low and high levels of perceived underemployment. Objective underemployment exerted an indirect curvilinear effect on task crafting through perceived underemployment. Organizational identification moderated the relation between perceived underemployment and task crafting. When organizational identification was high, employees engaged in more task crafting at intermediate levels of perceived underemployment. In Study 2, we operationalized the key variables in a different way to test the inverted U-shaped relationship between underemployment and task crafting. We constructively replicated this most complex portion of our model with a different operationalization of objective underemployment and task crafting. The two studies provided convergent evidence that employees craft their tasks when they are underemployed at low to intermediate levels, but gradually reduce their crafting efforts at higher levels of underemployment. Study 1 also confirmed that the underemployed actively used task crafting as a coping strategy, which ultimately affects creativity and OCBO.

## Theoretical Implications

By investigating the curvilinear mediating effect of task crafting that translated underemployment into positive reactions, such as creativity and OCBO, our research contributes theoretically and empirically to the underemployment literature. Whereas prior research has primarily focused on negative reactions, we advance the literature by identifying creativity and OCBO as potential positive reactions to underemployment.

We identified and tested task crafting as an active coping strategy that underemployed workers use to cope with underemployment in order to enhance their positive self-image. We draw on the job-crafting perspective, which has been previously absent in the underemployment literature. This perspective and the corresponding coping mechanism extend extant conceptual approaches that cast the underemployed as only passively reacting to fixed job characteristics. We contribute to the research on underemployment outcomes and initiate a new research direction that focuses on the positive side of underemployment. We emphasize that the perception of underemployment may be nonlinearly related to task crafting, which results in positive outcomes for organizations. By doing so, we attempt to partially account for the lack of consistency in previous research findings on underemployment (see, e.g., McKee-Ryan & Harvey, 2011 for a review).

Although our main contribution is to the underemployment literature, we also theorize that task crafting leads to creativity and OCBO. Hence, we contribute to the burgeoning literature on job crafting by demonstrating creativity and OCBO as two behavioral outcomes of task crafting. Although some theoretical work on job crafting has been developed (e.g., Hornung, Rousseau, Glaser, Angerer, & Weigl, 2010), few theoretical or empirical studies have linked job crafting to creativity and OCBO. An agentic perspective such as that used here might also prove useful in explaining other change-oriented outcomes, such as voice (van Dyne, Ang, & Botero, 2003) and taking charge (Morrison & Phelps, 1999).

## Managerial Implications

Our results have important implications for managers. Managers should not assume that employees will always respond negatively to their underemployment perceptions. Our results suggest that managers need to be vigilant in detecting perceptions of underemployment among employees. When managers notice

that their employees feel underemployed, they should support employees' efforts to craft tasks. Because the perception of underemployment may be experienced by many employees, managers should provide support to sustain positive outcomes in these situations. However, the inverted U-shaped relation between perceived underemployment and task crafting suggests caution to which positive reactions can be expected. The positive side of the inverted U-shaped relation implies that a low to intermediate degree of perceived underemployment may drive employees to craft their jobs actively in ways that benefit the organization. However, the negative side of the inverted U-shaped relation highlights that the large discrepancies between employees' capacity and job requirements are detrimental. Furthermore, our findings on the moderating role of organizational identification suggest that practices that enhancing organizational identification can help increase task-crafting efforts from employees perceiving themselves as underemployed. In sum, our results encourage managers to proactively work toward achieving positive responses to underemployment. Another relevant implication is that recruitment managers should not turn away job applicants who are overqualified because such individuals, if managed appropriately, may bring creativity and OCB to the organization.

### Limitations and Future Research Directions

As in most research, our studies have limitations. First, although we measured the independent and moderator variables at Time 1, the mediator at Time 2, and the dependent variables at Time 3 in Study 1, this time-lagged design still cannot establish causality unequivocally for all paths in our model. Longitudinal field studies or experiments may be the most rigorous research design for establishing the direction of causality.

Second, we conducted two studies with actual employees in China. The Chinese labor market has been in transition from being centrally planned toward being fully market driven (Liu & Wray, 2012). How individuals seek employment and how organizations manage their human resources in China are thus likely to bear more similarities with other market economies, such as the United States (Wei, 2014). Given the export-oriented growth model in China and the significant mismatch between the education system and the needs of the labor market, underemployment is widespread other than in low-paying manufacturing and manual labor types of jobs

(Carpenter, Lu, & Whitelaw, 2015). As suggested in some estimates, 84% of Chinese employees currently feel overqualified for their jobs (Global Press Report, 2012). As such, underemployment is likely to be as prevalent in China as in Western countries.

Because power distance is greater in China than in Western countries such as the United States (Hofstede, 2001), Chinese employees may find it more challenging to engage in task crafting, and subsequently to exhibit creativity and OCBO, than their U.S. counterparts (Zhou & Su, 2010). Future research seeking to extend and replicate our results may directly test whether power distance is a first-stage moderator in our model. However, Chinese employees tend to be more collectivistic than those in the United States (Hofstede, 2001). Chinese workers may find it easier to exhibit OCBO than U.S. workers do. Thus, our results may be a conservative estimate of what may be found regarding creativity in a matched U.S. sample, but may present an optimistic estimate regarding OCBO. We call for future research to directly test these interesting possibilities.

Third, attribution may play an important role in directing the underemployed to react positively versus negatively to underemployment (Liu & Wang, 2012), but our studies did not directly investigate this possibility. For example, if an employee attributes his or her underemployment to the competitive labor market, he or she may be more likely to react positively than negatively. If, however, the employee attributes his or her underemployment to unfairness, he or she may be more likely to respond negatively. We call for future research to directly test the role of attribution in guiding reactions to underemployment.

Finally, although our results showed that employees coped with perceived underemployment using task crafting, which resulted in creativity and OCBO, we do not know how long such a coping strategy can be sustained. After a prolonged period of underemployment, employees might stop engaging in such positive task crafting and even engage in negative behaviors. Our model also requires that jobs allow latitude in possible task crafting. The model may not apply if employees' work tasks are strictly constrained.

In sum, even with these possible limitations, our study emphasizes the importance of channeling underemployment into positive reactions. Our results advance the underemployment literature by suggesting that organizational identification assists in channeling the perception of underemployment into creativity and OCBO by encouraging task crafting.

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