

PREDICTING TOP PERFORMANCE: A STUDY OF SUSHI CHEFS

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A Thesis
in
The John Molson School of Business

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Administration (Management) at
Concordia University
Montreal, Quebec, Canada

July 2010

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Your file *Votre référence*
ISBN: 978-0-494-71019-7
Our file *Notre référence*
ISBN: 978-0-494-71019-7

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ABSTRACT

Predicting Top Performance: A Study of Sushi Chefs

Xiaolu Xu

This study investigated the distinction between an employee's typical performance and maximum performance, and tried to explore the link between specific individual characteristics and the discrepancy level between the two types of performances. We expected that personality would affect the level of difference between typical performance and maximum performance. In particular, we believed that Conscientiousness and Emotional Stability from the Big-Five model of Personality would have an impact on the employee's goal setting, goal commitment, performance expectancy, and self-regulation, all of which would further influence the employee's discrepancy level between typical and maximum performance. We also examined the impact of trait affect as well as state affect on the dependent variable, hypothesizing that operating on the cognitive-motivation processes, affect would be related to the discrepancy level between typical performance and maximum performance.

The sample of this study was composed of 48 sushi chefs in the Canadian food industry. Each participant was observed for typical and maximum performance measurement in working place, and asked to fill out questionnaires. The findings showed a significant performance discrepancy within individuals, and self-regulation, negative trait affect, as well as job tenure contributed to the intra-individual typical/maximum performance discrepancy. Contrary to expectations, personality traits and other affectivity variables were not significant in this study. Possible explanations, contributions and limitations, along with directions for future research, are discussed.

ACKNOWLEDGEMENT

I would like to take this opportunity to sincerely thank my thesis supervisor, Dr. Linda Dyer, for her invaluable guidance and immense support throughout this research process. Without her, I would not have reached my goals in the academic field.

I would also like to extend my thanks to my whole family and friends for their encouragement; especially to my fiance, Nam, for his great support-financially as well as mentally.

Finally, I would like to show my truthful respect and appreciation to Dr. Marylène Gagné for her sound advice over years, to Stéphane Brutus as a responsible committee member providing me with many valuable feedbacks, to John Fiset for his help on data analysis and emotional support, and to Lin Luo for his various helps.

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Predicting Top Performance: A Study of Sushi Chefs

The goal of nearly all research in organizational behavior, such as motivation, training, stress, ethics, job satisfaction and leadership, is to increase employees' job performance. In particular, a great proportion of human resource research on selection of new employees focuses on finding the "right" person at the beginning, who will make significant contribution for the organization's performance in the future. However, selection research has devoted more efforts to investigating various predictors of performance than performance construct itself (Campbell, 1990). The purpose of this study is to investigate the factors that encourage employees to expend maximum efforts to perform their jobs. Organizations would find this to be important because the performance of organizations to a great extent depends on employees' performance. This study will start with examining the construct of job performance, then investigate performance variability within employees, and at the end try to explore the predictors of intra-individual performance variability. An important contribution of this study is to help HR managers and employers to predict employees' daily performance, in order to select better performers for organizations and save many resources put on increasing employees' job performance.

Performance is a complex and multidimensional construct and is the baseline for any development and validation of predictors (Motowidlo, Borman, & Schmit, 1997). In order to better understand the relationships between specific predictors and specific aspects of performance, it is essential to identify the multiple dimensions of the performance construct (Kamdar & Dyne, 2007).

Definition and Dimensions of Job Performance

Motowidlo, Borman, and Schmit (1997) defined overall job performance as the accumulated contribution value derived from an individual's behaviors to the organization over a standard interval of time, which represents the ultimate effects of that individual's behaviors during that time interval on organizational goal accomplishment.

Researchers have posited that there are two types of performance: task performance and contextual performance. The distinction between task performance and contextual performance can be explained by two quite different means through which an individual's behaviors contribute to organizational goal accomplishment (Motowidlo, Borman, & Schmit, 1997). Borman and Motowidlo (1993, page 73) defined task performance as

“the proficiency with which job incumbents perform activities that are formally recognized as part of their jobs, activities that contribute to the organization's technical core either directly by implementing a part of its technological process, or indirectly by providing it with needed materials or services.”

Within the broad domain of performance, of equal importance with task performance is contextual performance, involving organizational citizenship behavior and prosocial behavior which contribute to organizational effectiveness in ways that maintain or improve organizational, social, and psychological context in order to serve for the core tasks. Good examples of contextual performance criterion measures include helping coworkers, complying with organizational values, policies, and regulations, communication, and courtesy (Borman & Motowidlo, 1997).

In contrast to contextual performance, counterproductive performance includes such behaviors that detract from organizational goals and harm the well-being of the organization (Rotundo & Sackett, 2002). As such, counterproductive performance plays a unique role in understanding the multidimensional construct of performance.

Motowidlo, Borman, and Schmit (1997) offered a theoretical model suggesting that different dimensions of performance construct have different antecedents. Specifically, this model posits that different aspects of individual differences in basic tendencies such as personality and cognitive ability can affect different performance domains. Furthermore, variability of characteristic adaptations in knowledge, skills, and work habits, which are determined by basic tendencies as well as learning experiences, would mediate the causal relationships. In another words, the kinds of knowledge, skills, and habits related to task performance are different from those related to contextual performance. Additionally, cognitive ability variables have the strongest effects on task knowledge, task skills, and task work habits, and consequently are most related to task performance. Personality variables, on the other hand, have the strongest impact on contextual knowledge, contextual skills, and contextual work habits, and accordingly are most associated with contextual performance (Motowidlo, et al., 1997). Nonetheless, the authors further argue that cognitive ability can still partially predict contextual performance through its influence on contextual knowledge (e.g. knowing how to comfort and cheer up a stressed colleague); similarly, personality still has some effects on task performance mainly by means of affecting task work habits (e.g. characteristic tendencies to setting difficult goals, exerting more effort, and being persistent on task). The “crossover” effect of personality is very helpful and has laid a solid foundation for

the theoretical development of the current research being undertaken, which will focus on task performance and aim at examining its predictors on specific criteria with certain measurements (details will be discussed later).

Dimensions of Task Performance

Quality vs. Quantity Task performance can be distinguished in terms of its quantity and quality measurements (Jenkins, Mitra, Gupta, & Shaw, 1998). For example, the main task for the job of sales representative involves contacting existing and potential customers and selling products or services to them. Performance on this task consists of a quantitative dimension (sales volume) and a qualitative dimension (product and service knowledge provided to customers).

Subjective vs. Objective Task performance can also be determined with subjective measures (e.g. supervisory rating on employees' job performance) versus objective measures (e.g. the speed and accuracy in processing items for the job of cashier).

Moreover, **short term vs. long term, general vs. specific, and proximity of organizational goals** correspond to Smith's (1976) three-dimensional typology of criteria described below.

Besides the classification of task performance *measurements*, a number of typologies exist for categorizing task performance *criteria*. For example, Ghiselli (1966) offered an approach to categorize studies examining test validities as using either **training criteria or job proficiency criteria**. In addition, Smith (1976) categorized performance criteria as **behavior vs. results vs. effectiveness**. And Motowidlo, Borman, and Schmit (1997) focused on behaviors rather than results as performance criteria for the

main reason that performance could be affected by numerous factors out of the individual performer's control and hence may not truly report his or her own contribution value to the organization. The next typology of criteria—*Maximum condition vs. Typical condition*—will be described in detail very soon since it is the most pertinent to the present study.

Performance Variability within Individuals

Past research (e.g. Scott & Hamner, 1975; DeNisi & Stevens, 1981; Kane, 1986; Rabbitt et al., 2001; Lecerf, Ghisletta, & Jouffray, 2004) has found that an individual's performance always varied from the mean of his/her performance level and such variation derived from the fluctuations in the performer's motivation level as well as in the individual characteristic constraints which might include race, sex, age, working experience, and so on. The variation of performance within individuals seems to surface in Scott and Hamner's (1975) work. Their study provided a phenomenon that among those who exhibit the same level of overall performance, some individuals may consistently perform at the same level whereas other individuals' performance may be more variable. Rabbitt et al. (2001) also noticed that some individuals were more variable in their performance than others and Lecerf, Ghisletta, and Jouffray (2004) argued that such variability, independent of level of performance, provided fundamental information characterizing individuals.

A major goal of this thesis is to understand the mechanism of intra-individual performance variability and find out potential predictors.

Typical and Maximum Performance

We have briefly discussed the phenomenon of intra-individual performance variability derived from individual characters and internal motivation levels, external motivation constraints should also be addressed on different performance levels (i.e. typical vs. maximum performance) within individuals.

Although distinctions between typical and maximum performance variables have long been recognized and established (Marcus, Goffin, Johnston, & Rothstein, 2007), dominant research studying the distinction has mainly focused on the contextual or task conditions created in favor of measuring one instead of the other (e.g. presence or absence of implicit or explicit instructions, long versus short task duration, existence or inexistence of observation or evaluation, and so forth; Mangos, et al., 2007). Little previous research has both theoretically and empirically examined the mechanism of this issue in recent years.

Maximum performance refers to an individual's optimal performance on a given task which should last a sufficiently short period of time so that the individual can maintain a high level of effort throughout the measurement period (Sackett, Zedeck, & Fogli, 1988). By contrast, typical performance is measured over an extended period of time during which individuals are neither aware that their performance is being observed and evaluated, nor are they instructed to consciously attempt to perform at their best (Sackett, Zedeck, & Fogli, 1988). In brief, maximum performance measures are designed to reflect what one "can do" whereas typical performance measures are designed to reflect what one "will do" (Cronbach, 1960).

In addition, DuBois and her colleagues (1993) provided an alternative to the three defining characteristics of maximum performance proposed by Sackett et al. (1988). The alternative definition explains from “the perspective that maximum performance is the level of individual performance that is demonstrated at times of peak job demands” (DuBois, Sackett, Zedeck, & Fogli, 1993), in contrast to a standardized work sample test (Sackett, Zedeck, & Fogli, 1988). For some jobs, this realistic definition for maximum performance is significant, because different jobs value typical vs. maximum performance differently. In Canada, for example, the fiscal season starting from February to April means peak job demands for accountants and is vital for accountancy firms to serve their customers and make profits, because the deadline for all the Canadian residents and many businesses to report tax to government is approaching. In such situation, employers tend to place much more value on employees’ maximum performance than their typical performance. Instead, for insurance sales representatives, there might be no such peak job demands, and typical performance is more valuable for their organizations. Employers, depending on their organizational values, could benefit from the applied perspective to choose the most appropriate performance measures for the job in the selection process.

In the research literature of maximum-typical performance, maximum performance refers to one’s *potential* performance while typical performance relates to one’s *actual* performance (Mangos, Steele-Johnson, LaHuis, & White, 2007). For example, most applicants are required to take the Graduate Management Admission Test (GMAT) before they are enrolled into post-graduate business programs, because GMAT has been regarded as a validity test reflecting their *potentially* optimal academic performance once

they are enrolled in. As a matter of fact, the average GPA as well as the quantity and quality of published articles (under certain programs like PhD) reflects their *actual* academic performance over the entire period of graduate program study.

Although it originally used the terms *typical* and *maximum performance* to differentiate between ability measures and personality measures, Cronbach's (1960) work dealt with maximum-versus-typical performance distinction only on the predictor side (ability vs. personality) and did not pay much attention to the performance criteria.

After that, research on criterion measures for typical and maximum performance was established. Many researchers have examined either at individual level or at group level the distinction between the two types of performances on both the predictor and criterion side (e.g. Sackett et al., 1988; DuBois et al., 1993; Ployhart et al., 2001; Lim & Ployhart, 2004; Freudenthaler et al., 2008; and so on). In the following section, the main findings from several studies on typical versus maximum performance shall be presented.

On the criterion side, in what appears to be the first empirical study distinguishing between typical and maximum performance, Sackett et al.'s (1988) research utilized objective typical and maximum performance measures of the same criterion construct. This study deepened our understanding of performance criterion measurement by addressing the categorization of criteria with contextual or task conditions. Three task conditions were proposed as necessary for grouping a measure into "maximum performance" or "typical performance". Specifically, conditions for maximum performance include 1) explicit or implicit instructions for the participant to maximize effort; 2) the participant's awareness of being observed and evaluated; and 3) sufficiently brief task duration to facilitate the participant to maintain the instructed level of effort on

the task. Data were gathered from two large samples (Ns=635 and 735) of cashiers from 12 supermarket chains: newly hired employees and incumbent employees. The data reflected two dimensions of job performance: speed and accuracy in processing items. The maximum performance measure was a job sample test, and the typical performance was a 4-week daily performance. Despite high reliability, relatively low correlations between typical and maximum performance measures were found (0.14 and 0.32 for the speed dimension; 0.11 and 0.17 for the accuracy dimension). The results of Sackett et al. (1988) demonstrated that significant distinction between typical and maximum performance exists for the job of cashier.

On the predictor side, Sackett et al. (1988) further argued, but did not empirically demonstrate, that ability was more related to maximum than typical performance measure whereas motivational factors were more associated with typical rather than maximum performance measure; and potential moderators such as job complexity could exist as to the relation of typical performance to maximum performance.

In a follow-up study, DuBois et al. (1993) investigated differences in validities of cognitive ability predictor measures (e.g. numerical ability, perceptual ability, memory) against supermarket cashier typical and maximum performance criteria (speed and accuracy). DuBois and her colleagues used Campbell's (1990) three factors of motivation-the choice to expend effort (direction), the choice of which level of effort to expend (level), and the choice to persist in the expenditure of that effort (persistence). These three motivational factors were applied to the three defining characteristics of maximum vs. typical performance conditions and provided a theoretical explanation from the predictor level of why typical and maximum performance may differ. According to

their theory, performance is the function of ability and motivation. Under maximum performance conditions, choices about time on task, level of effort, and persistence of effort are being strictly monitored to maintain maximal motivation and therefore performance primarily reflects performer's task-related abilities. By contrast, under typical conditions, individuals are not aware that their performance is being observed and evaluated, nor are they consciously attempting to perform to the best of their ability and thereby such motivation variables are less constrained. As such the relative impact of variance in ability on performance declines and the relative impact of variance in motivation grows.

The results of this study (DuBois et al., 1993) moderately supported this hypothetical relationship, indicating that ability significantly correlated with maximum performance but not with typical performance. The authors attributed the significant correlation between typical and maximum performance to the ability components they share and reached the conclusion that varying performance under typical versus maximum performance conditions was primarily due to changes in performers' motivation. This study has been cited as the only publication after Sackett et al. (1988) empirically addressing the typical versus maximum performance distinction for a dozen years (Klehe, Anderson, & Viswesvaran, 2007). Furthermore, it is the first study to explicitly explain the typical-maximum distinction and provides a theoretical foundation central for the current research.

In line with DuBois et al.'s (1993) rationale, ForsterLee (2007) found that the weight of influence of different motivational variables on the performance of a verbal knowledge test varied under conditions of maximum versus typical performance and he

attributed it to different level of efforts required under different contexts. Klehe and Anderson (2007) tested and verified Sackett et al.'s (1988) model of typical versus maximum performance by inviting 138 undergraduate students to perform an Internet-search task and found that motivation was more related to typical performance while ability was more related to maximum performance, which is consistent with DuBois et al.'s (1993) argument and finding but with relatively higher task complexity (compared with scanning items in the job of cashier).

We should note that studies by Sackett et al. (1988) and DuBois et al. (1993) both relied on relatively objective measures of job performance. Given the popularity in use of subjective ratings for both research and administrative purposes, it seems questionable, or even inappropriate, to generalize results from objective measures to instances where subjective ratings are used (Ployhart, Lim, & Clan, 2001). Ployhart et al. (2001) argued that objective and subjective criterion measures are not interchangeable. Therefore, these researchers replaced Sackett et al.'s (1988) objective measurement with peer and supervisory ratings in a sample of candidates for entry-level leader positions in a large East Asian military unit, and also found significant distinction between typical and maximum performance. In addition, the follow-up analyses (Lim & Ployhart, 2004) compared typical and maximum performance measures at the group level and found that typical and maximum performance were not significantly correlated with each other because they were different constructs and had different antecedents. More specifically, Lim and Ployhart's (2004) findings indicate that transformational leadership is more critical in maximum performance conditions and fully mediates the relationship between personality and team performance whereas the impact of personality on typical

performance is more salient as transformational leadership only partially mediates the relationship between personality and team performance in typical working conditions. That is to say, except being mediated through transformational leadership, personality plays a unique role in affecting typical performance.

Marcus, Goffin, Johnston, and Rothstein (2007) extended previous research on the maximum-typical distinction in entry-level jobs to more complex jobs (manager) and extended subjective measurement of performance based on one-dimension ratings from different sources to multidimensional supervisory ratings; the results supported the distinction between typical and maximum performance and also confirmed personality and cognitive ability as antecedents of typical and maximum performance. In other words, their study provided support that personality can significantly predict the motivation level of typical performance for more complex jobs like managers.

Based on the above findings, it is reasonable for us to speculate that what individuals actually do (typical job performance) in their work is not equal to what they are able to do for their jobs (maximum job performance) because motivation sources are different in different performance conditions.

Intra-individual Performance Discrepancy between Typical and Maximum Performance

Given the research on performance variation within individuals in combination with typical-maximum performance literature, we could speculate that individuals are not always performing close to their maximum performance and that there is always a typical-maximum performance discrepancy within an individual. Such phenomenon may

also exist that some employees' typical performance is much lower than their maximum performance; while in other employees, the difference is less marked. More specifically, it is possible that two individuals may have the same level of maximum performance but differ in typical performance, or that two individuals may have the same level of typical performance but differ in maximum performance. More variable performance does not necessarily mean larger typical-maximum performance discrepancy level within an individual. For example, in Scott and Hamner's (1975) study, given the same level of overall performance among the participants, those with more performance variation might perform more closely to their maximum performance and thus have less typical-maximum performance discrepancy. Therefore, the following question is of great interest: "what factors affect the size of difference between typical and maximum performance within an individual"? *The current study aims to explore this question by examining the distinction between an employee's typical performance and maximum performance, and investigating the possible links between personality, affect and the level of difference between the two types of performances.*

An important contribution of this study is to help organizations improve the design and validation of selection systems and practice effective organizational interventions aimed at shrinking the gap between typical and maximum performance so as to achieve the optimization of individual and organizational performance and the realization of the organization's strategic goals.

Previous research has identified what factors (e.g. compensation level) could be influenced by the intra-individual variability in job performance (e.g. Steiner, Rain, & Smalley, 1993; Fox & Bizman, 1995; Barnes & Morgeson, 2007). For example, Barnes

and Morgeson (2007) examined intra-individual discrepancy between maximum and typical performance and found that such discrepancy could predict compensation level.

However, little research has tried to identify potential predictors of the level of difference between typical and maximum performance within an individual. The research of Mangos, Steele-Johnson, LaHuis, and White (2007) was one exception. A multiple-task measurement framework for complex job settings presented in the work conquered the difficulty in assessing maximum performance longitudinally in the research literature and satisfied the need for organizations to assess maximum and typical performance changes over time within individuals. The conception of action orientation versus state orientation was drawn from the action control theory, which involves an individual characteristic difference in the ability to divorce unproductive cognitions, quickly initiate goal-related actions, and to persist on necessary activities without being distracted (Kuhl, 1994, for a review). Mangos et al. (2007) found that despite a similar level of maximum performance for both groups (action-oriented vs. state-oriented), action-oriented people were better able to maintain relatively high level of efforts on performance on the typical dimension while exerting additional efforts on maximum performance and therefore had less maximum-typical performance discrepancy than state-oriented people in the variable-priority working condition. This result satisfied the original assumption offered by DuBois et al. (1993)—the key issue in the variance of typical performance from the maximum standard was the level of variance in motivation and further indicated that such level of motivation variance within an individual could be predicted by personal characteristics.

In the literature, it had been traditionally assumed that personal motivation was highly monitored by external motivational variables such as explicit instructions, short task duration, and availability of evaluation in maximum conditions, and consequently played a very limited role in affecting maximum performance which was mainly the reflection of one's ability. Specifically, researchers on typical-versus-maximum performance distinction have proposed that maximum performance interventions have a uniform effect on motivation of all individuals; such interventions constrain all the three motivational factors (i.e. time on task, level of effort, and persistence of effort) to result in constant and maximal motivation (Campbell et al., 1993; DuBois et al., 1993). From this point of view, under maximum performance conditions, internal motivational variables such as need for achievement, self-expectancy, and self-efficacy will not affect performance. However, research, at the outset of the 21st century, commenced to challenge such a notion by both theoretically and empirically suggesting that the difference between performer's typical and maximum performance may be more complex and may not be as straightforward as had initially assumed (Kirk & Brown, 2003; Klehe & Anderson, 2007; Klehe, Anderson, & Hoefnagels, 2007; Witt & Spitzmüller, 2007).

Kirk and Brown's (2003) test of latent motivation construct (proximal & distal motivation) under maximum performance conditions seems to be the first trial to challenge the original notion. The findings revealed the deficiency of establishing maximum performance as a pure measure of ability and indicated that DuBois et al.'s (1993) estimate of the role of ability in maximum performance had been overly optimistic. The researchers found significant effects of internal individual differences in

proximal (work-domain self-efficacy) and distal (need for achievement-Pursuit of Excellence, Competitiveness, Mastery) motivation on performance during the walk-through performance test under maximum test conditions. Work-domain self-efficacy is one dimension of proximal construct, which is primarily associated with an individual's maintenance of effort on work-related activities; while Pursuit of Excellence and Competitiveness belong to distal construct, which mainly deals with motivational choice behaviors or processes distant from actual behaviors (Kanfer & Heggstad, 1999; Kirk & Brown, 2003). All the three factors loaded significantly on the motivation construct, and the motivation construct accounted for 46 % ($p \leq .01$) proportion in maximum performance comparisons. Particularly, the structural model suggested that employees with relatively high level work-domain self-efficacy, pursuing excellence in their work performance, but with lower competitiveness, scored highest on the walk-through performance test.

Witt and Spitzmüller (2007) extended the paradigm of ability-maximum by demonstrating that moderators existed on the relationship between general mental ability and maximum performance. The authors argued that different levels of motivation caused by individual differences were involved under the maximum performance situations to affect the extent to which workers express their work competence, so that maximum performance may reflect individual differences not only in ability but also in motivation. Klehe, Anderson, and Hoefnagels (2007) addressed the typical-maximum performance distinction from the perspective of social inhibition and revealed that abilities predicted by maximum performance for the individuals with low self-efficacy would be underestimated. Based on research on social facilitation and inhibition, Klehe and her co-

workers argued that specific motivational variables (e.g. self-efficacy) may have differential impact on performance when interacting with maximum vs. typical performance interventions. Even though maximum performance interventions have highly constrained personal motivation level to be constant and maximal, the characteristics of maximum interventions (i.e. evaluative settings) may foster performers with high task specific self-efficacy to perform to their potential while inhibit those with low self-efficacy from performing optimally. This study found that compared with those with low self-efficacy, participants with high self-efficacy performed better on an explaining task under maximum conditions, whereas no significant difference emerged in the typical performance situation.

It is also worthy to note that participants with low self-efficacy scored lower on both the content and the behavioral dimensions of performance in the maximum performance situation than in the typical performance situation, which is consistent with the previous arguments but conflicts with most of the findings regarding typical versus maximum performance.

Klehe and Anderson (2007), in their laboratory study, found that participants' performance under the maximum performance situation with no exception significantly surpassed their performance during both the first and the second typical performance period when performing an internet-search task. More important, in this study, although the role of motivation decreased in accounting for maximum performance and the role of ability decreased in explaining typical performance, motivation (i.e. direction of effort) still explained a considerable proportion of variance in performance under maximum performance conditions while ability (i.e. procedural skills) was the second most relevant

predictor of performance during both typical performance periods, which partially supported the findings reported by Kirk and Brown (2003) as well as Klehe, Anderson, and Hoefnagels (2007). There is one point inconsistent with Klehe, Anderson, and Hoefnagels (2007): task-related self-efficacy significantly predicted both maximum and typical performance and related to typical performance much more than performance under maximum performance interventions. Furthermore, the variation of performance under typical versus maximum performance conditions was caused not only by motivation (direction of effort) but also by procedural knowledge. The researchers attributed the incremental validity of ability in the prediction of the second typical performance assessment to the participants' distractions caused by the presence of observer as well as to their evaluation anxieties raised by evaluative nature of the maximum performance condition.

Consequently, it might be possible that quite a lot of selection research has overestimated the criterion-related validity of many job performance predictors without paying necessary attention to other factors which actually exert more influence on either task performance criterion (typical vs. maximum) than they appear to. The recent research including Kirk and Brown (2003), Klehe and Anderson (2007), Klehe et al. (2007), and Witt and Spitzmüller (2007) broadened our minds in such a way that the discrepancy level between a performer's typical and maximum performance could not always be fully explained by distinct motivation level and hereby questioned the held-true but never tested assumption that internal motivation had little influence under maximum conditions and maximum performance was a valid reflection of ability. Accordingly, the discrepancy level between maximum and typical performance within an

individual is suggested to be attributed not only to motivation level but also to ability level, both of which could be determined by individual differences, task characteristics, task conditions, or the interactions among the three variables.

Contribution of the Present Study to the Relevant Literature

After reviewing and comparing the most recent studies concerning typical versus maximum performance (e.g. Kirk & Brown, 2003; Mangos, Steele-Johnson, LaHuis, & White, 2007; Klehe & Anderson, 2007; Klehe, Anderson, & Hoefnagels, 2007), there are some points worthy of our notice.

Methodological issue with maximum/typical research The central issue in the current study is to examine the intra-individual discrepancy level between typical and maximum performance. Among the limited number of studies addressing this issue (i.e. Mangos, Steele-Johnson, LaHuis, & White, 2007; Klehe & Anderson, 2007), nearly all the studies were conducted in the laboratory, which would raise our concern on task duration. The duration of task for typical performance measured under a laboratory setting might be too short to realistically reflect typical performance if otherwise measured in the natural working field. In reality, employees commonly work eight hours a day and five days a week, which might result in a different level of discrepancy between typical and maximum performance within the same person (here “different” is emphasized-neither greater nor smaller, because the discrepancy level may also be determined by other potential factors listed below).

Spaced vs. Intensive task situation Despite both experiments conducted in the laboratory, Klehe and Anderson (2007) and Mangos, et al. (2007) created relatively high

level of freedom for participants during the typical performance periods. Klehe and Anderson (2007) allowed participants to spend time on task-unrelated activities such as phone calls, Web chatting, reading task-irrelevant websites and observers were absent during the typical performance period. Mangos, et al. (2007) provided equally spaced performance sessions and participants could get 10-min break between each statistical trial and between each performance block. Both situations provided for typical performance measurement, with the exception of short task duration, is similar to the real working environment under which employees have relatively high-degree autonomy on tasks (e.g. deciding order and pace of less structured job tasks) or situational strength is weak (receive little supervision and bear little pressure from the tasks-reflected through such behaviors as leaving their work at any time for break or other task-irrelevant activities without fearing any post hoc consequences). Equally likely, however, task situations exist in reality that entail working under intensive surveillance or under overwhelming task demands (e.g. assembly line job). From the consideration on this issue some questions arise: 1) whether task situation and task autonomy are potential variables affecting the intra-individual level of difference between typical and maximum performance; 2) whether specific individual characters can predict typical performance across task situations and tasks with different autonomy degrees; and 3) across task situations and task autonomies, whether individual differences can account for the variance level between typical and maximum performance within an individual through motivational-cognitive mechanism alone.

Resource-Sensitive vs. Resource-Insensitive nature of task The resource allocation perspective has been frequently applied to the learning and training context to

analyze the distinct mechanisms through which goal setting, self-regulation, task complexity, and practice condition interact to influence learning outcomes (e.g. Kanfer & Ackerman, 1989; Kanfer, Ackerman, Murtha, Dugdale, & Nelson, 1994; Kanfer, Ackerman, & Heggstad, 1996). According to Kanfer and Ackerman (1989), task performance can be viewed as the functioning of individual differences in attentional resource capacity, task requirements for attentional resources, and motivational processes (i.e. self-regulatory processes) facilitating the attentional resource allocation across activities. Based on the model, Ackerman, et al. (1994) further argued that difficult and specific goal assignments can aid performance only when individual attentional resource capacity surpasses the attentional resource requirements imposed by the task so that the individual can spend additional attentional resources needed to trigger the psychological operation on the self-regulatory processes (like devoting more efforts to the task) which are stimulated by the goal assignments. To put it in another way, goal setting and self-regulatory skills can promote performance only when performers have enough attentional resources and the task is resource-insensitive to the performers. Combining with the previously described studies central to the current research (i.e. Klehe & Anderson, 2007; Mangos, Steele-Johnson, LaHuis, & White, 2007), we find that both tasks undertaken during typical performance period were resource-insensitive to the participants given the short task duration, spaced task situation, and less performing pressure from situations. Based on this finding, it is a wonder whether the explanation power of motivation variance as well as variance in procedural knowledge predicted by individual differences in motivation level (Kirk & Brown, 2003; Witt & Spitzmüller, 2007; Klehe, Anderson, &

Hoefnagels, 2007; etc.) from resource-insensitive tasks can still remain strong among resource-sensitive tasks.

Previous research suggests that a perfect balance exists between task demands and personal resources (Mangos, et al., 2007). Combined with the key tenets of the resource allocation framework, postulations are advanced in the current research that a) an existing balance between task demands and personal resources indicates the task is resource-insensitive to the performer; b) the predictive validity of individual differences in motivational variance for intra-individual discrepancy level of typical and maximum performance is less significant among resource-sensitive tasks than among resource-insensitive tasks; c) personal resources include both cognitive (attentional resources) and physical (energy); d) given a specific task, resource sensitive versus insensitive is not represented as a dichotomy but a continuum, not absolute but relative, which is determined by personal resource capacity, task duration, task situation, and the frequency of task performance. For example, in the laboratory experiment of Mangos, et al. (2007), the task duration was relatively brief for each session, which suggests a small amount of attentional resources required to perform the task and therefore much lower than most participants' resource capacities. If the task duration for each session lasted longer (completion of 100 trials instead of 10 trials), the attentional resource requirements imposed by the task would increase and exceed certain participants' resource capacities. At that time, for those participants with lower level of resource capacities, the task would change to be resource-sensitive from resource-insensitive. Similarly, if the task situation strength became stronger by increasing the surveillance strength or explicit instructions to maximize efforts, the aforesaid task change would happen.

Although the task was complex, suggesting a substantial amount of task requirements for attentional resources, participants could get 10-min break between each session, which could help them regain attentional resources and so buffer their resources drain quickly. Conversely, if there was no time for participants to take rests (i.e. intensive rather than spaced performance session) , it would be very hard for them to maintain their attentional resource capacity to a high level, resulting in lower capacity level than corresponding task requirements and finally altering the task from resource-insensitive to resource-sensitive. Consequently, the significant predictor as one of the individual characters (action-oriented vs. state-oriented) for the individual discrepancy level of typical and maximum performance found by the researchers would be less valid.

Novel vs. Usual task This point may also involve the above concern. The frequency of task performance, defined as “how often skills are used in the time between training and testing” (Kirk & Brown, 2003) has been demonstrated to be an effective situational variable in typical performance (McCloy, Campbell, & Cudeck, 1994). It is also suggested as a crucial variable distinguishing between novel and usual tasks. However, both Mangos, et al. (2007) and Klehe and Anderson (2007) presented a novel task in their respective experiment. Such studies may have external validities in the learning context or across such jobs or occupations as often dealing with diversified or challenging tasks. Nevertheless, most jobs and occupations have specific work domains which involve a certain bound of knowledge and ability required for job performance. Among the typical performance measurements on novel tasks undertaken in the laboratory, the frequency of task performance is tiny when compared with the usual tasks repeated with high frequency which facilitates performers to possess relatively stable and

fixed job knowledge and skills. Therefore, it takes risks to generalize the theoretical and empirical findings involving novel tasks to the literature involving usual tasks. Therefore, the incremental predictive validity of procedural skills for the individual performance variance under typical versus maximum performance conditions may be partially due to the unstable task-related knowledge caused by the low-level frequency of task performance. Moreover, job tenure is argued to be highly correlated with the frequency of task performance so that capable of predicting typical performance level. On a given task, five-year job tenure may relate to higher level of performance frequency than three-month job tenure. From the perspective of resource-sensitivity task nature, such argument is also tenable. People with higher job tenure tend to be more adapted to the task requirements for personal resources and thus demonstrate higher level of effort and persist longer on task performance. For those people, the task is more likely to be resource-insensitive. Accordingly,

H1: People with high job tenure will have less performance discrepancy than people with low job tenure.

In the following section, four hypotheses are proposed to explore the potential factors which are able to predict individual performance discrepancy between typical and maximal performance.

Personality and Job Performance

Many researchers have proposed that individual differences in job performance can be traced to dispositional tendencies (e. g. Barrick & Mount, 1991; Barrick, Mount, & Strauss, 1993; Gellatly, 1996; Hertz & Donovan, 2000; Ployhart, Lim, & Chan, 2001; Barrick, Stewart, & Piotrowski, 2002; Judge & Ilies, 2002; Thoresen, Bradley, Bliese, & Thoresen, 2004; Lim & Ployhart, 2004; Kamdar & Dyne, 2007; Oh & Berry, 2009). However, little research attempts to explore whether and what dispositional factors might influence an individual's level of difference between typical performance and maximum performance, not to mention the mechanisms through which dispositional traits influence performance discrepancy. The present study will fill the gap by exploring the possible links and assessing the cognitive-motivational processes during which personality and affect may influence the typical/maximum performance discrepancy.

Personality is regarded as an important factor in many areas of organizational behavior, which include job satisfaction, motivation, ethics, leadership, stress, organizational politics and so forth (Johns & Saks, 2005). Emotional stability refers to the extent to which a person can appropriately control his or her emotion. People who score low on this dimension tend to show poor emotional adjustment in stress, anxiety and depression. Extraversion represents the tendency to be sociable, outgoing and positive. Individuals who score high on Agreeableness are tolerant, cooperative, easygoing and trustworthy. Openness to experience consists of tendencies to be creative, flexible, curious, and adaptability. Finally, conscientious people are responsible, achievement-and detail-oriented, dependable, and positively motivated (Barrick & Mount, 1991). Campbell, McCloy, Oppler, and Sager (1993) suggested that job performance was a

function of declarative knowledge (e.g. facts), procedural knowledge (e.g. skills), and motivation (e.g. effort), all of which to some extent could be predicted by personality; and personality is able to influence performance to most extent through motivation (Judge & Ilies, 2002).

Conscientiousness and Emotional Stability are the best predictors of motivation, whereas theory and research on the remaining three Big Five traits and performance motivation have been less clear or even unstudied (Judge & Ilies, 2002). We could not locate any studies in the literature that included any of the three traits as predictor on motivation with generalizable validity across occupations and job situations. Motowidlo, Borman, and Schmit (1997) may provide a valid explanation for such phenomenon. As described by Campbell et al. (1993), “crossover” effect of personality is posited to exist on task performance by means that specific personality traits like Conscientiousness and Emotional Stability may influence task work habits which include characteristic motivational responses such as provisions of more effective problem solutions, choices for higher level of effort and persistence on versus distractions from task in the face of difficulties and challenges, more attentions on task details and plannings, and so forth; whereas the other three personality traits contribute mostly to contextual work habits by, for instance, affecting the adoptions of certain social and interpersonal styles instead of others (Motowidlo, Borman, & Schmit, 1997). The author hereby proposes that working on task performance, Conscientiousness and Emotional Stability will predict an individual’s level of difference between typical and maximum performance.

Effects of Conscientiousness on intra-individual level of difference between typical and maximum performance First, goal setting theory and expectancy theory are

employed to illustrate the mechanisms through which conscientiousness influence work performance. Subsequently, the results from several experimental and field studies on the relationship between conscientiousness and work performance are described. Finally, the findings from several meta-analytic research on the relationship between personality and work performance are presented.

Conscientious people are responsible, achievement-oriented, dependable, and positively motivated. These characteristics would motivate people to work hard, set more difficult goals, highly commit themselves to accomplish their goals, and have higher expectation for themselves (Barrick & Mount, 1991; Barrick et al., 1993; Gellatly, 1996). Viswesvaran (2001) argued that conscientiousness can affect overall performance by multiple pathways: first, conscientious people tend to spend more time on tasks and on acquiring job knowledge, which will lead to greater productivity; second, conscientious people are expected to perform better on organizational citizenship; and finally, conscientious people are detail-oriented so that they could acquire more job knowledge and greater productivity. Barrick, Mount and Strauss (1993) tested the relationship between conscientiousness and performance among 91 sales representatives. By reviewing previous literature, the authors found that representative traits of conscientiousness were closely associated with the three defining choice behaviors of motivation—"choice to expend effort, choice of level of effort to expend and choice to persist in that level of effort" (Barrick, Mount & Strauss, 1993, p. 716). Conscientious people are purposeful, organized and therefore are more likely to set goals for themselves (i.e. choice to expend effort); moreover, individuals who score high in conscientiousness are more likely to work hard, set high standards for themselves and to be achievement

oriented, which lead them to set more difficult goals (i.e. choice of level of effort to expend); conscientious individuals are also dependable, responsible and persistent, and consequently tend to try their best to accomplish what they have set for themselves and highly commit themselves to their goals (i.e. choice to persist in that level of effort) (Barrick, Mount & Strauss, 1993). As is well known, goal setting positively affects job performance (Barrick, Mount & Strauss, 1993; Gellatly, 1996). Therefore, they assumed that conscientiousness was an important determinant of goal setting behaviors and conscientiousness was related to job performance through mediating motivational variables, such as goal setting and goal commitment. The results of the linear structural equation modeling in this study supported the hypothesis, indicating that highly conscientious people could be expected to autonomously set goals and exert more efforts to achieve difficult, challenging goals and thus to perform better.

A laboratory study conducted by Gellatly (1996) investigated the relationship between conscientiousness and task performance in a sample of 117 business students. The author found that besides being mediated by goal choice which had been supported by Barrick et al. (1993), the relationship between conscientiousness and task performances was also mediated by performance expectancy. Among the evidence supporting Gellatly's (1996) argument, two meta-analytic reviews cited in his study had consistent findings that accumulated expectancy measures positively correlated with both goal choice and task performance. Furthermore, individuals, when they are aware that there is a negative discrepancy between performance and goals, will reduce the discrepancy either by lowering their goals or exerting more efforts to achieve their goals; and it is reasonable to speculate that highly conscientious individuals are more likely to

reconcile the discrepancy by devoting more attention and efforts to their tasks (Gellatly, 1996). Moreover, it has been demonstrated in this study that high-conscientious individuals set higher goals and thus perform better than their low-conscientious counterparts mainly because they have higher expectancies for their performance (Gellatly, 1996).

In other field studies, Salgado and Rumbero (1997) found that conscientiousness was correlated with job problem-solving ability, job motivation, as well as with global job performance in financial service managers. Barrick, Stewart, and Piotrowski (2002) and Thoresen with his colleagues (2004) demonstrated consistently positive relationships between conscientiousness and job performance in the sample of sales representatives. More importantly, conscientiousness was shown significantly related to individual performance growth in the latter study. Subsequent work by Kamdar and Dyer (2007) and Oh and Berry (2009) have seemed to solidify the status of conscientiousness to predict job performance.

Several meta-analytic studies also investigated the effects of personality on job performance. Consistent with the above results, Barrick and Mount's (1991) meta-analytic review, wherein the effects of the Big Five personality dimensions on three job performance criteria (job proficiency, training proficiency, and personnel data) among five occupational groups were studied, suggested that conscientiousness showed consistent relation with all the three performance criteria across the five occupations. In a meta-analysis of all available studies of personality and job performance in the European Economic Community (EEC), Salgado (1997) found that conscientiousness was a valid predictor generalized across occupational groups (including police, professionals,

managers, sales, and skilled labor) as well as across the three job criteria with a validity that valued .11 for personnel, .26 for rating, and .39 for training. Similar to Barrick and Mount (1991; ranging .03-.13) and Salgado (1997; ranging .01-.10), Hertz and Donovan (2000) found that the estimated true validities for explicit measures of the Big Five ranged from .06 to .20, and the estimated true-score correlations ranged from .07 to .22. More important, Hertz and Donovan (2000) also found that conscientiousness had the highest validity of the Big Five dimensions (true validity = .20), which were consistent with Barrick and Mount (1991) and Salgado (1997). More meta-analytic research by Mount and Barrick (1995) and Judge and Ilies (2002; average validity = .24) has also “consistently supported conscientiousness as one of the few personality-based predictors with generalizable validity across occupations and job situations” (Thoresen, Bradley, Bliese, & Thoresen, 2004).

Thus, the literature reviewed above all indicates that conscientiousness is positively related to overall performance and task performance. When applied to the present study, the relevant literature leads us to speculate that highly conscientious individuals will react less markedly to external motivational conditions (whether or not they are being observed or evaluated, exposed to explicit instructions, or face sufficiently short work duration) since they are more likely to possess the propensities from within to set higher goals for their work, have higher expectancy on performance, and highly involve themselves to accomplish these goals. Such propensities lead them automatically to work hard even under less externally controlled typical working conditions, resulting in their typical performance closer to their maximum performance. In contrast, low conscientious people seem to lack such internal propensities, react more significantly to external motivational

variables, and therefore are expected to have higher discrepancy level between typical and maximum performance. Hence,

H2: The typical/maximum performance discrepancy will be smaller for people high in Conscientiousness than for people low in Conscientiousness.

Effects of Emotional Stability on intra-individual level of difference between typical and maximum performance Emotional Stability, refers to the extent to which a person can appropriately control his or her emotion (Goldberg, 1993). This trait is sometimes called neuroticism, a label for the negative pole. Although this area has been studied less than conscientiousness, evidence indicates that emotional stability is correlated with performance. People with low scores on this dimension tend to show poor emotional adjustment in stress, anxiety and depression, and thus are more likely to divert their attention from and exert less effort on their job performance (Kanfer, Ackerman, & Heggstad, 1996). That is to say, people with low scores on this dimension tend to be unable to regulate themselves appropriately to focus on their work without any emotional disturbance and have poor self-regulation ability in lessening the negative influence of emotion on their job performance. Malouff et al. (1990) linked Neuroticism with performance through goal orientation. The authors argued that high anxiety would impair concentration on setting goals and making plans which further weaken performance. In Study 1, anxiety was found to be significantly associated with goal orientation. In Study 7, however, anxiety was found to have a non-significant relationship with goal-orientation. Malouff and his colleagues attributed such conflicting results to the possibility that two

different anxiety scales had been used, which might have measured different characteristics of anxiety. The researchers also suggested that there might be no relationship between goal orientation and anxiety or the relationship might be complex, like U-shaped relationship (some levels of anxiety enhance goal orientation and higher levels impair it). Nevertheless, the inconsistent results indeed raised the question of whether a real relationship exists between goal orientation and maladjustment, which seems more pertinent to our present study aiming to examine whether emotional stability affects performance through a motivational mechanism. This study did find that depression, one dimension of maladjustment, was significantly related to goal orientation.

Kanfer and Heggstad (1999) stressed that people with good emotional control expend effort to minimize the negative influences of performance anxiety, worry, and off-task distractions; while poor emotional controllers are more easily distracted from task completion by worry, anxiety, and other unrelated activities. It is posited that self-regulation would be a potent mediator during the working processes of Emotional Stability on performance.

Involved by research on self-regulation processes, historical empirical foundation of goal setting did not provide consistent results on learning and performance outcomes. Findings in the goal-setting literature typically show that the difficult and specific performance goal assignments stimulate on-task motivation and decrease off-task attention so as to facilitate task performance improvement (e.g. Zimmerman, Bandura, & Martinez-Pons, 1992), while other studies have indicated that such typical positive effect of goal setting on performance may not hold for performance of novel, complex tasks versus tasks judged as simple within a learning context (e.g. Kanfer & Ackerman, 1989;

Kanfer, Ackerman, Murtha, Dugdale, & Nelson, 1994). Such inconsistent arguments might find some reasons in the works of Kanfer and Ackerman(1989) and Kanfer, et al. (1994). Kanfer and Ackerman (1989) intergrated two central constructs of applied psychology-motivation and cognitive ability and suggested an information-processing framework considering how abilities, dynamic task demands, and self-regulation processes engaged in determining task performance. According to the model, difficult and specific goal assignment stimulate self-regulation processess which typically enhance performance by increasing on-task effort; however,task complexity and timing of goal setting requires further consideration of the processes through which goals may impede performance. In a series of studies within a skill-acquisition context, substantial support was found for this theoretical framework. Specifically, the authors found that difficult and specific goals assigned during the initial phase of training inhibited performance. That is because during the initial phase trainees devoted their maximal attention to grasping the new skill; when the difficult goals were introduced at that time, they would cause self-regulatory activities which could divert the subject's attention away from the task and hence hinder performance. During the later period of training when the task that was initially resource-dependent became more resource-insensitive (higher levels of performance and decreasing demands on attention) with task practice and trainees had spare cognitive resource to devote to the task , the negative effects of self-regulation diminished. Moreover, it was found that such detrimental effects were more evident for trainees with lower abilities and for more complex tasks.

The potential cost to trigger self-regulation processes not only involved with the timing of goal setting and task complexity as illustrated above but also with type of

practice (massed-practice vs. spaced-practice). From the perspective of cognitive resource allocation, Kanfer et al. (1994) posit that the break time in spaced-practice allows trainees with specific and difficult goals to deal with self-regulation activities by using cognitive resources which might be unavailable during the task trial. Their empirical study found that goals and practice conditions interacted in determining novel and complex task learning. Specifically, in the massed-practice condition without breaks, trainees with specific, difficult goal assignments tended to perform poorer than trainees in control group with do-your-best goals. In contrast, in the spaced-practice conditions where goals were assigned to trainees during the break time, the trainees with goals performed marginally better after break than control trainees.

Consistent with above findings, the previous research on self-regulation has also indicated the motivational or volitional effects of self-regulation on learning and performance, in terms of internally generated self-regulation processes as well as the functions of self-regulatory strategies (e.g. Garcia & Pintrich, 1994; Kuhl, 1985; Bielaczyc, Pirolli, & Brown, 1995; Kanfer, Ackerman, & Heggestad, 1996). Kanfer and Heggestad (1999) address that self-regulation involved in proximal motivational processes can direct an individual's attention to or away from completing task demands (caused by strategy development), to or away from off-task activities (triggered by worry), and can affect the individual's decisions to increase or decrease attentional effort on the task.

“.../i>n the absence of specific training, adult learners bring different levels of self-regulatory skills to novel learning environments. That is, they are more or less prone to worry and negative emotions when confronting early task failure, or they differ to the

degree that they will persist in devoting attention to a task after they have reached a minimal level of success in a learning task.” (Kanfer, Ackerman, & Heggestad, 1996, p. 187)

In addition, Kanfer and Heggestad’s (1997) model predicts that anxiety leads to poor self-regulation, and trait anxiety is closely related to Neuroticism ($r = .76$) and performance ($r = -.30$) (Kanfer, Ackerman, & Heggestad, 1996). Back to our present study, it is reasonable to believe that when confronting task difficulty or negative emotions, individuals with high emotional stability are able to regulate themselves appropriately to minimize or avoid the negative influences of anxiety, stress and worry on their performance, while individuals with low emotional stability have inadequate self-regulatory skills to protect themselves from such negative influences on their working performance.

Substantial empirical studies found that Emotional Stability was capable of significantly predicting working performance (e.g. Ployhart, Lim, & Clan, 2001, $r = .08$; meta-analyses: Judge & Bono, 2001, $r = .19$; Judge & Ilies, 2002, $r = .31$; Salgado & Rumbo, 1997, $r = .19$). In Hertz and Donovan’s (2000) meta-analytic study of the relationship between personality and job performance, although Emotional Stability appeared to have low predictive validities ($r = .13$ & $.12$) for sales and customer service jobs, such true validities were rather stable and consistent. It is also noteworthy that the true validity estimates of emotional stability for skilled and semiskilled jobs were not significantly above zero. The authors interpreted that the interpersonal characteristic which differentiated skilled and non-skilled jobs might account for the different results.

As the literature has shown that self-regulation usually accounts for the greatest amount of variance in performance and emotional stability is closely related with self-regulation, it is anticipated that emotional stability will affect the level of individuals' performance. However, there is no certain to make that the effect of self-regulation plays more salient on typical or maximum performance. Considering the highly monitored external motivational variables in maximum conditions and their principal impact on maximum performance, we assume that the influence of self-regulation would be less significant on performance under maximum conditions rather than on performance of relatively long task duration in typical conditions. Therefore, the following hypotheses are tentative:

H3a: The typical/maximum performance discrepancy will be smaller for people high in Emotional Stability than for people low in Emotional Stability.

H3b: The Emotional Stability-performance discrepancy link will be mediated by the level of self-regulation.

As Goldberg (1993) defined, emotional stability refers to the extent to which a person can appropriately control his or her emotion. Neuroticism, the negative pole of emotional stability, is usually correlated with the experiences of negative affect such as anxiety, anger, and depressed mood (Matthews & Deary, 1998). Therefore, in addition to personality, the impact of affect on performance will also be examined in the present study, given the fact that employees are working and living with an array of affect

(Johnson, Tolentino, Rodopman, & Cho, 2010) and that the importance of affect on various job-related outcomes has been addressed across a variety of disciplines and supported by social psychological, behavioral, cognitive, and psychological evidence.

Affect and Intra-individual Performance Discrepancy

This research will explore the impact of affect on performance by assessing the different latent information processing channels (cognitive and motivational) wherein affectivity operates.

Forgas and George's (2001) affect infusion model (AIM) and Weiss and Cropanzano's (1996) affective events theory respectively explain how affect could directly or indirectly influence various organizational outcomes through cognitive processes.

Forgas and George's (2001) affect infusion model (AIM) suggests that affect can directly influence organizational judgments and behaviors through cognition. Judge and Larsen's (2001, p. 74) statement also supports this argument: "..., in evaluating our jobs, as when we think about mostly anything consequential, both cognition and affect are involved. When we think, we have feelings about what we think. When we have feelings, we think about what we are feeling." According to the AIM, affect promotes the availability of cognitive information and constructs that match the mood state. Because "it influences both what people think (the content of cognition) and how people think (the process of cognition)" (Forgas & George, 2001; p. 4), affective states or moods can critically influence such work-related behaviors as work motivation, absenteeism and turnover, employee helpfulness and creative performance; organizational judgments in

terms of performance appraisals, selection interviews, and job satisfaction; interpersonal communication; bargaining and negotiation; and so forth.

In another recent theoretical advance, Weiss and Cropanzano (1996) argued that people's job-related attitudes and behaviors are partially the consequences of their cumulative affective experiences at work. According to Weiss and Cropanzano's affective events theory (AET), affective experiences both directly and indirectly influence job attitudes and work behaviors. Such influence on attitudes functions directly in the affective judgment part of satisfaction and indirectly through the influence on various other events related to job satisfaction. There are two kinds of behaviors: affect driven behaviors (direct influence) and judgment driven behaviors (indirect influence). Affect driven behaviors include such behaviors as involving in processes of mood management, and they could also be directly influenced by affect operating on cognition processing or judgment biases. Compared with affect driven behaviors, judgment driven behaviors are indirectly influenced by affective experiences through the mediation of job satisfaction and are the consequences of decision processes which involve in one's evaluation of job partially contributing to the decision making process. Since nearly all kinds of work involve various cognitive processing, judgmental or decision making processes, and affect is able to directly or indirectly influence the above processes, it is reasonable to argue that affect might have effects on individuals' job performance.

Motowidlo et al. (1997) provided an appropriate example to illustrate these two theories. After training and practice, sales representatives possess adequate knowledge about how to deal with angry customers in an effective way, that is, stay calm and polite with complaints, and sincerely help customers to resolve problems. However, sometimes,

in such situations they feel defensive and react with hostility and fail to follow the best way to work out. That is because task work habits “also include characteristic responses to situations that do not necessarily reflect motivational processes” (Motowidlo, Borman, & Schmit, 1997, p. 81) but do reflect employees’ cognitive judgments, evaluations, and decisions which further drive certain behaviors. Therefore, it is posited that affective responses are able to interfere with or promote performance by exerting influence on those characteristic adaptations. In the present study, the effects of trait affect on performance will be first discussed, then followed by state affects.

Trait affect Watson and Clark (1984) defined negative trait affect as the tendency to experience aversive emotional states such as fear, nervousness, tension, worry, and distress over time and across situations, even in the absence of any source of stress. Conversely, positive trait affect reflects the tendency to experience a general sense of well-being, and individuals with high positive trait affect tend to report high levels of energy, concentration, and pleasures (Watson, Clark, & Tellegen, 1988).

In a recent study, Johnson, Tolentino, Rodopman, and Cho (2010) systematically examined the cognitive and motivational processes through which both trait positive affect (PA) and trait negative affect (NA) operate on task performance. Johnson and his colleagues believed that positive trait affect would be positively related to task performance whereas negative trait affect would be negatively related to task performance. First, PA benefits creative and dynamic cognitive activities and information processing while NA detracts from attentional and cognitive resources needed for task performance. Second, PA tends to activate a promotion regulatory focus which involves an approach-oriented motivation mindset to drive employees to work towards goals and

behave towards ideal end states; in contrast, NA is more likely to trigger a prevention focus mindset which guides employees to be avoidance-oriented and behave far away from ideal states. Third, PA facilitates looking forward, setting challenging and difficult goals as well as experiencing high self-efficacy while NA fosters looking backwards on past mistakes, fears of making mistakes in the future, and experiencing low self-efficacy. Lastly, given the interdependent and cooperating nature of effective task performance in many jobs, the qualities of PA such as being enthusiastic, positive, and appreciative may enhance relationships with supervisor and coworkers and help receiving positive appraisal from supervisor and coworkers on task performance; conversely, NA may damage social cohesion and have negative effects on job performance.

Quite a lot of evidence, including Johnson et al.'s (2010) study, supports the above theoretical models. Historical research has shown that negative trait affect relates negatively to job performance (Cropanzano, James, & Konovsky, 1993; Johnson, Tolentino, Rodopman, & Cho, 2010), job and task satisfaction and organizational commitment (Levin & Stokes, 1989; Agho, Price, & Mueller, 1992; Cropanzano, James, & Konovsky, 1993; Necowitz & Roznowski, 1994; Brief, Butcher, & Roberson, 1995; Thoresen, Kaplan, Barsky, Warren, & Chermont, 2003), turnover intentions (Cropanzano, James, & Konovsky, 1993), task feature perceptions (Necowitz & Roznowski, 1994), and positively with withdrawal behaviors (Necowitz & Roznowski, 1994), job stressors and job strains (Brief, Burke, George, Robinson, & Webster, 1988; Chen & Spector, 1991; Burke, Brief, & George, 1993; Spector & O'Connell, 1994; Heinsich & Jex, 1997; Spector, Chen, & O'Connell, 2000), and counterproductive performance (Johnson, Tolentino, Rodopman, & Cho, 2010). Conversely, positive trait affect relates positively

with job performance (Cropanzano, James, & Konovsky, 1993; Staw & Barsade, 1993; Wright & Staw, 1999; Fortunato & Williams, 2002; Johnson, Tolentino, Rodopman, & Cho, 2010), supervisor evaluation and coworker support (Staw, Sutton, & Pelled, 1994; Johnson, Tolentino, Rodopman, & Cho, 2010), organizational commitment and turnover intentions (Chen & Spector, 1991; Cropanzano, James, & Konovsky, 1993; Thoresen, Kaplan, Barsky, Warren, & Chermont, 2003), job and task satisfaction (Agho, Price, & Mueller, 1992; Duffy, Ganster, & Shaw, 1998; Fortunato & Williams, 2002; Thoresen, Kaplan, Barsky, Warren, & Chermont, 2003), as well as prosocial and organizational citizenship performance (Johnson, Tolentino, Rodopman, & Cho, 2010).

Thoresen, Kaplan, Barsky, Warren, and Chermont (2003) conducted a large-scale, comprehensive review of the affect-job attitude literature, which supported the significant impact of affect on job-related attitudes and found that positive affect was positively associated with personal accomplishment, organizational commitment, job satisfaction and negatively related to emotional exhaustion, depersonalization, and turnover. On the other hand, negative affect was found to be negatively related to job satisfaction, organizational commitment, and personal accomplishment, all of which are posited to further associate with employees' cognitive as well as motivational processes underlying their job performance. Wright, Cropanzano, and Meyer (2004) reported the results of two field studies demonstrating that both trait affects were related to job performance and made significant relative contributions as predictors of job performance.

State affect Weiss and Cropanzano (1996) also admitted that affective dispositions exert main effects on job attitudes and work behaviors only when positive or negative events take place. That is to say, people with positive trait affects tend to react more

strongly to positive events and people with negative trait affects tend to react more strongly to negative events when they happen to occur. More importantly, the AET theory addresses that both situational variables and personal variables have main effects, and mood is the interaction between contextual factors and dispositional affects. The authors grouped the effects of mood into four categories: mood effects on memory, mood effects on evaluative judgments, mood effects on processing strategies, and mood effects on social behaviors, all of which are significantly associated with task performance as well as contextual performance.

Prior research has proposed state affect or mood as a more important perspective in understanding team performance, prosocial behavior, and work motivation (George, 1991; George & Brief, 1996; Wright, Cropanzano, & Meyer, 2004; Jordan, Lawrence, & Troth, 2006; and so forth). While only negative mood was found to be significantly related to job performance in Wright et al.'s (2004) study, George (1991) argued that positive mood at work was significantly and positively associated with both extrarole performance and role-prescribed prosocial organizational behaviors. In a service setting with 221 salespeople, he found that salespeople's positive mood on the job promoted the quality of customer service rated by their supervisors. In this study, customer service is one of the forms of role-prescribed prosocial behavior which is one dimension of job performance. George and Brief (1996) proposed that moods critically influence both distal and proximal work motivation. Based on expectancy theory, the authors argued that positive mood influenced the cognitive process by causing workers to have higher assessment on expectancy, instrumentality, and valence through the operation of mood-congruent judgment, mood-congruent recall, and mood effects on attributions and thereby enhance

initial involvement, interest, and enthusiasm for work tasks. Based on control theory, George and Brief (1996) reasoned that positive mood promoted ongoing motivation during task engagement by favorably affecting a) the judgment of progress made towards a task goal (by leading the individual to estimate that he is rapidly progressing towards the task goal), b) the choice of reference criterion level (the setting of higher reference criterion level) in order to lead workers to persistently put effort to reach higher performance standards. In this case, state affect is assumed to influence performance through a motivational mechanism.

Jordan, Lawrence, and Troth (2006) explored the relationship between team members' negative mood and team performance mediated by team processes (social cohesion, workload sharing, and team conflict). By conducting surveys among two hundred and forty one undergraduate students who took eight weeks to complete an independent task, the researchers found that individual negative mood negatively influenced team performance by decreasing team members' perceptions of team social cohesion and increasing their perceptions of team process conflict. However, research also suggests that individuals high in negative affect actually may perform better on cognitively oriented tasks than individuals low in negative affectivity.

For example, the results of Jordan, Lawrence, and Troth (2006) support that negative mood can significantly predict team workload sharing and team personal conflict so as to positively affect team performance by increasing team members' perceptions of team task conflict compared with team process conflict. Therefore, it suggests that instead of a simple linear relationship argued by previous research, "an inverted U relationship" between negative emotion and task performance may exist,

which means that either too much or too little emotionality can be detrimental to task performance or “a moderate level of emotionality... contributes to better team performance” (p. 142).

There are still compelling reasons for caution when advancing the following hypotheses: 1) most of the research reviewed above indirectly related affect to job performance through various mediators such as job attitudes; 2) the literature directly linking affect and performance through cognitive-motivational processes is not substantial; 3) the literature regarding the effects of affect (both trait and state) on job performance has been less clear or even confusing. However, the conflicting arguments and findings in the literature mainly occurred at the group level and in the field of negative state affect. Moreover, the positive effect of negative mood or perhaps the negative effect of positive mood is assumed to occur only when “big events” happen and it is regarded as extreme cases. In general, our speculation is consistent with the motivational and cognitive theory of “mainstream” in the affect literature. It is argued that, either directly or indirectly, positive affect will positively influence and negative affect will negatively influence the employee’s motivation and cognition level of performance. Likewise with the hypothesis generation about Emotional Stability, the highly monitored external motivational variables in maximum conditions will limit an individual’s cognitive resources to deal with emotions during performing on a task, which otherwise would be allowed by typical conditions. Accordingly, it is hypothesized that affect measures, grouped by trait vs. state, positive vs. negative, each accounts for a unique contribution as correlates of typical rather than maximum job performance, thus exerting an impact on typical/maximum performance discrepancy.

H4a: High positive trait affect will reduce the discrepancy level between typical and maximum performance within an individual.

H4b: High negative trait affect will enlarge the discrepancy level between typical and maximum performance within an individual.

H5a: High positive state affect will reduce the discrepancy level between typical and maximum performance within an individual.

H5b: High negative state affect will enlarge the discrepancy level between typical and maximum performance within an individual.

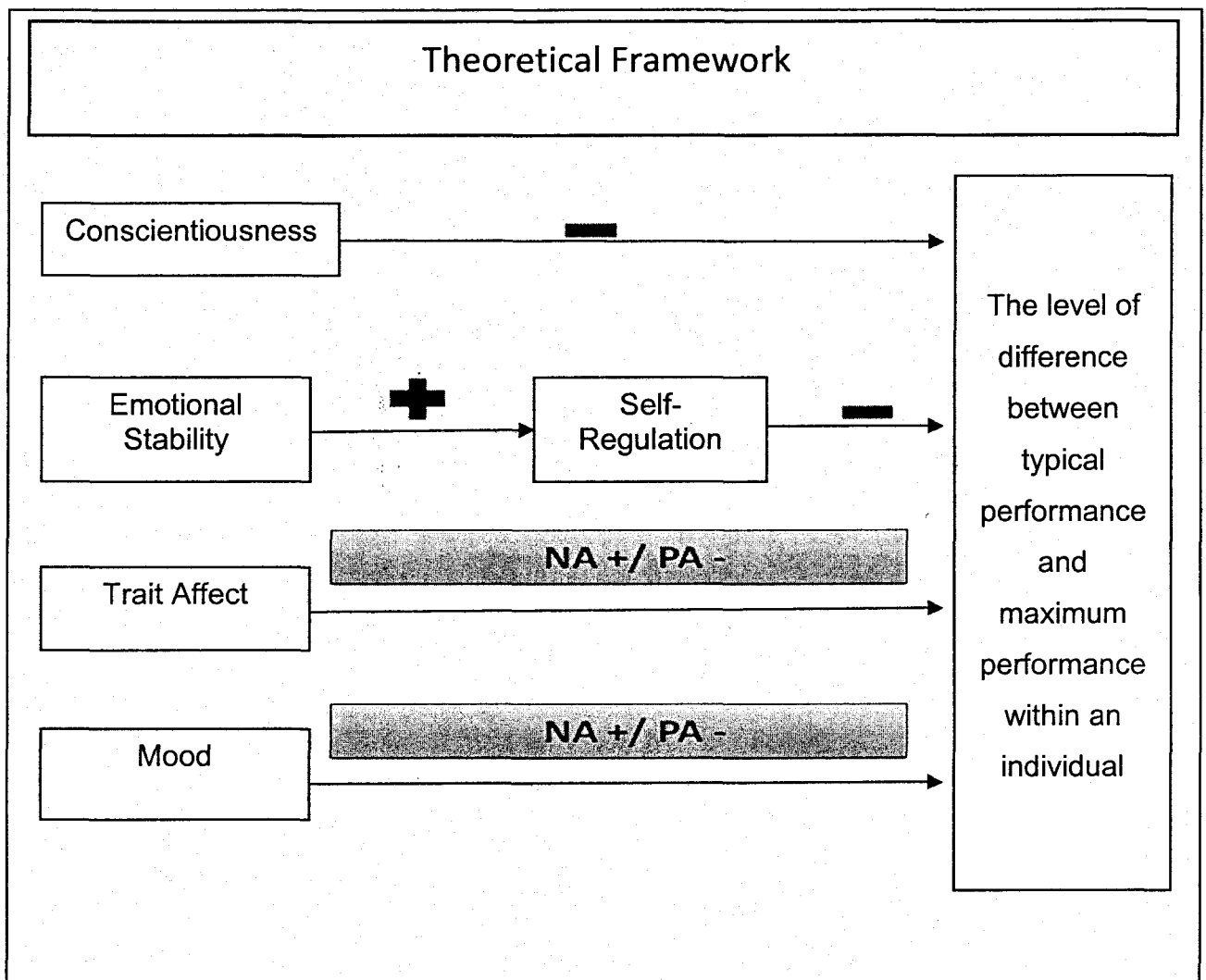
However, given the multidimensional construct of job performance as mentioned in the introduction, it would be prudent for us to identify specific dimensions of performance and categorize occupation types before generalizing the hypotheses across situations and occupations. Table 1 (see Appendix A) references the empirical articles from the literature review where different aspects of job performance were found to be related with specific dispositional and affective predictors (but does not represent an exhaustive list of all articles in this research field).

Table 1

Summary of the Dimensions of Job Performance Predicted by Personality and Affects

The current study contributes to the literature on typical versus maximum performance by investigating the effects of individual differences on the level of difference between typical and maximum performance within a person. This research question was put forth in the article by Mangos, Steele-Johnson, LaHuis, and White (2007) as well as in Sackett's (2007) study. Individual character is argued as one of the sources of maximum-typical performance discrepancy. It is interesting to investigate whether, what, and how individual differences will impact the level of variability between typical and maximum performance. The current study starts with examining the intra-individual discrepancy level from the cognitive-motivation perspective. Although motivation is not the solely function for the level of difference between typical and maximum performance, it is assumed that motivation still accounts for a significant part of the performance variation. The dependent variable is intra-individual maximum-typical discrepancy. Independent variables are individual differences which in this study are limited to conscientiousness and emotional stability from five-factor model of personality, trait affect, and state affect or mood (reasons will be discussed later). The main premise of this study may be seen in the Figure I (below).

Figure I



Other Contributions of the Present Study

Students vs. Real Employees The subjects in both studies from Mangos, et al. (2007) and Klehe and Anderson (2007) were undergraduate students. And the choice of students as experimental subjects has also existed in many social psychological research involving various cognitive, distal and proximal motivational variables, and performance (see Table 1, for reference). From the perspective of social psychology, one obvious

distinction might be that research involving students contributes more to the literature in educational psychology while research targeting actual employees provides more information for the literature in industrial-organizational (I-O) psychology. Since these two groups are related to different psychological fields, it might be inappropriate and deficient to generalize the findings in one field to the literature in the other field. The same deficiency may also exist in the literature examining the relationships between job performance and personality as well as affect, where quite a few studies used students as subjects and applied the conclusions post hoc to the real employment setting. In order to contribute to the I-O psychological literature, the current research is therefore based on real employees by using chefs in sushi restaurants as participants.

Objective vs. Subjective performance measures In the literature examining relationships between task performance and personality as well as affectivity, a great deal of research has relied on relatively subjective measures of job performance such as supervisory ratings (Table 1 for review), which might be attributed to the evolution of research field in I/O psychology. More complicated and advanced occupations and professions have been investigated in the literature, from entry level jobs to senior management level, from labor-dependent work to brain work, and from jobs involving simple task to those with multiple tasks. In this regard, objective measurement is not universal to measure performance across situations, especially for more complicated job, and thus appears to be less popular and lacks enough attention from researchers. However, the historical research does not seem to have provided a foundation for the theory development on typical versus maximum performance as solid as for other well-developed theories such as goal-setting theory, expectancy theory, etc. Quite a few gaps

still exist in the performance literature, particularly concerning typical and maximum performance. Given that objective and subjective criterion measures are not interchangeable, the current study feels obligated to reinforce the groundwork, starting from basic entry-level job involving simple task by using objective measures of typical and maximum performance.

Physical vs. Cognitive requirements of the task Regarding the relationships between task performance and individual dispositional characters, the literature concentrates mostly on cognitive-oriented tasks (Table 1 for review), which would raise our concern whether the predictive validity of personality as well as affect on performance of cognitive-oriented tasks can still be generalized across physical-oriented tasks. Furthermore, in the typical/maximum performance literature, nearly all the studies focus on relatively cognitive-oriented tasks, which also leaves a gap for us to fill. As a matter of fact, a lot of labor-dependent jobs exist in the real world, which should receive as much attention as the cognitive jobs from researchers. Therefore, the present study will choose a physical work to conduct the experiment in order to test the proposed framework.

Method

Participants

The sample for this study was composed of 50 sushi chefs from ten sushi restaurants in a large Canadian city (male, $N = 32$ and female, $N = 18$). The participants

were mainly found by posting a recruitment message on a local Chinese forum on internet and referrals from participants in the study (snowball sampling). Participation was voluntary and everyone received a small payment for participation.

Since the subjects in the current study are sushi chefs, it is necessary to understand the nature of the sushi making job before measuring participants' work performance. The sushi chef's main tasks include preparing fish, seafood, vegetables, cooking sushi rice, making sushi, maki, rolls, decorating Sashimi Combo plates, ordering raw materials and peripheral sushi making ingredients from suppliers, and planning menus. Normally, these tasks should be done in the morning before the first customer sits down at the table. In addition, the sushi chef's main responsibilities also involve maintaining proper sanitation within the department, showing courtesy to customers, presenting food with a variety of colors and textures as well as with a neat and clean look. Based on the above description, the job nature for sushi chefs is physical-oriented.

As the researcher observed, most customers came between 12pm to 1pm and usually they took one hour for lunch. The task situation during the rush hour is intensive. All the restaurant bosses or managers intensively supervised in order to make sure everything went well and customers could get timely and satisfactory service. In this case, the most important attribute of a sushi chef is the ability and experience in providing sushi items at a fast pace in a customer sensitive working environment and therefore serving speed in terms of completing one-piece sushi making is valued as the most important dimension of sushi chef's job performance. One advantage of choosing speed (number of pieces per hour - behavior) rather than quantity (number of pieces - result) is discussed by Motowidlo, Borman, and Schmit (1997), who suggested that outcomes

could be affected by numerous factors out of the individual performer's control and may not truly report his or her own contribution value to the organization. Therefore, it seems inappropriate to take results as performance criteria.

The rush hour working environment fits the conditions required for typical performance: a) although employees were intensively supervised during the rush hour, managers paid much more attention to waiting attendants, customer arrangement, and dealing with checks. Sushi chefs received less attention and were not being observed as much as in maximum testing conditions; b) according to the observation from the researcher, sushi chefs did not get any explicit or implicit instructions to maximize efforts; 3) the task duration lasted at least one hour and normally 1.5-2 hours since customers arrived in succession, which was long enough for typical performance measurement.

Participants' ages varied from 21 to 52 years old, and their average age was 31.96 years ($SD = 7.49$). Among the participants, 46 were Chinese, 3 were Korean, and 1 was Canadian born Chinese. The 46 Chinese participants reported Chinese (the written Chinese is almost the same for mandarin and Cantonese) as their primary language, the 3 Korean participants reported Korean as their primary language but had a good understanding of English, and the Canadian born Chinese participant reported English as his primary language.

Procedure

This study was a field experiment conducted in participants' working places. Each research session started with a brief introduction by the researcher, where she expressed appreciation for the subjects' participation, presented an overview of the research

procedure, read the consent form for participation stating the assurance of confidentiality of the responses, benefits of participation, payment for participation, and direct contact with the participants, and then collected the signed forms.

The session began with a survey questionnaire which was developed to measure participants' personality related to this study, self-regulation, and their trait affect, as well as standard demographic variables. Each participant was asked to fill out the questionnaire, seal it in an envelope provided, and return it to the researcher. Some participants were not able to fill out the questionnaire on site, the researcher returned a week later to pick up the completed questionnaires before she started to observe their typical performance. The option of returning the questionnaire directly to the researcher by mail was also offered to participants, but nobody took it. Then participants were observed in their working places for daily performance for two-day rush hours. Order effect may exist if the researcher asks participants to fill out a questionnaire measuring mood on the same observation day with typical performance measurement. For example, the exhausting work, receiving negative comments from customers and supervisors, and disagreements with co-workers could affect a subject's mood which, however, cannot objectively reflect his/her mood before and during the observation period. In order to minimize the order effect caused by such cases, the researcher asked participants to fill out the questionnaire each time before observing their typical performance rather than after the observation. At the end, a 30-minute job sample test was conducted among all the participants (but not on the same day, depending on the availability of participants).

Pilot Test

A pilot study was conducted with the sushi chefs in this sample (N=5). Participants were asked to make one piece of the popular orders among most customers such as Sashimi (including Salmon, Beef, Crab, Oil Fish, etc.), Sushi (including Salmon, BBQ Eel, and Caviar Submarine), Maki (including Dragon eye, Kamikaze, and California), and Cornet (including Phoenix roll and Fusion roll). At the same time, the time taken to make each piece was counted (from 14-16 *seconds* on average). The result suggested that the difference of making time for each kind of sushi was not significant and it would have little influence on the results of this study. Thus, we could simply count by piece during the measurement period for typical as well as maximum performance without needing to take sushi kind into consideration.

Measures

The experiment was run in Chinese for the forty-six participants with Chinese nationality, given the fact that their English language skills were often not high enough for them to fully understand the items in English. All scales and questionnaires cited in English were translated into Chinese and then back-translated into English by researcher of the current study. For the three Korean and one Canadian born Chinese sushi chefs who reported a high-level understanding of English, the original English version was provided.

Typical performance. Performance was measured as the average time needed to complete one-piece sushi making (serving speed).

For typical performance, each participant was observed and counted how many sushi pieces he/she made during the rush hours on the typically busy business days of a week. Choosing rush hours is for the purpose of controlling customer demands which is a latent external variable and might exert a significant influence on chefs' typical performance. Under following situations, serving speed would have insufficient predictive validity for typical performance:

1. Unconventionally busy hour means unexpected peak task demands for the chefs.

The performance measured under such condition fits the definition of maximum performance suggested by DuBois et al. (1993). Such case could occur in every restaurant with a good chance but with very low frequency (optimistically once a month). Hence, it would be inappropriate for us to regard the serving speed measured under such situation as employees' typical performance.

2. Chef's task demands are extremely customer-sensitive. Measured under a circumstance with an inadequate number of customers, serving speed will greatly depend on the frequency of customer orders. Chefs have to stop making sushi if no more orders are provided, even though they are "willing to" work more.

Typically busy business days enable sushi chefs to constantly receive orders from customers during the rush hours and to a certain extent determine their own serving speed "at will" (there were several sushi chefs working behind the counter at the same time, which could provide the opportunity for chefs to slow down their own serving speed without being noticed and count on other people to work harder – free rider effect). Each participant was observed twice and the researcher averaged the number of sushi made during the two-day rush hours (for the same reason as described above-minimizing the

external effects triggered by customer on the variation of typical performance as well as for the purpose of measuring mood effects on typical performance).

Maximum performance. The researcher tested the participants how many sushi pieces they were able to make in thirty minutes so as to measure their maximum performance. Before participants started, the researcher instructed them to try their best to make as many sushi pieces as possible and offered a prize for the winner who could make the most sushi pieces in the thirty minutes. Maximum performance was measured after measuring their typical performance so as to reduce order effects. If maximum performance is measured before typical performance and before rating their dispositional traits, participants would figure out their performance in the maximum conditions may be correlated with the following observation of their typical performance, their ratings in the personality and trait affects questionnaires whatsoever. As such, they would maintain relatively high typical performance during observation periods and evaluate their traits in an artificial way. Accordingly, maximum performance was measured at the end of the field study. Moreover, the researcher chose another independent day to measure participants' maximum performance for the sake of eliminating the effect of the exhaustion of cognitive and physical resources after a hard-working day.

Worthy to note, the present study design for measurement of the two types of performance met the conditions advanced by Sackett et al. (1988) to examine the distinction between typical and maximum performance: *same level of specificity for typical and maximum performance measurements and same point of job tenure for obtaining an individual's performance measures.*

Demographic characteristics. Demographic information collected included the age, gender, nationality, and primary language. In addition, the questionnaire asked participants to state how many years they had been a sushi chef and how many years they had been working in the participating restaurants.

Personality. The variables Conscientiousness and Emotional Stability were measured with items from the Big Five personality inventory developed by Goldberg (1999). Specifically, either personality dimension had 10 items to measure. The questions presented in the inventory are based on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Conscientiousness include: “I am always prepared” and “I pay attention to details”. Sample items for Emotional Stability include “I get irritated easily” and “I often feel blue”. The scales of both Conscientiousness and Emotional Stability dimension were scored such that higher numbers indicate higher qualities of the personality. The Cronbach’s alphas of the scales for the data in this study were .84 (Conscientiousness) and .58 (Emotional Stability). Since the researcher was unable to find a previously validated Chinese version of the Big Five inventory, it was translated from English into Chinese by the researcher herself, which might be the reason for the low Cronbach’s alpha of Emotional Stability. Therefore, in order to improve its internal reliability, three items —“I seldom feel blue”, “I worry about things”, “I am easily disturbed” — were dropped and the Cronbach’s alpha was increased to .72.

Self-regulation. This study used the 13 items of short-term self-regulation from ASRI (Adolescent Self-Regulatory Inventory) which had been developed and validated by Moilanen (2007) to measure participants’ self-regulation. Sample items include: “When I’m bored I fidget or can’t sit still” and “I can start a new task even if I’m already

tired.” Each item is responded on a 5-point scale ranging from 1=strongly disagree to 5=strongly agree. Like the dimensions of personality, higher scores indicate higher qualities of self-regulation. The Cronbach’s alpha of the scale for the data in this study was .72 (2 items — “During a dull class, I have trouble forcing myself to start paying attention”, “I can calm myself down when I’m excited or all wound up” — dropped to improve internal reliability).

Mood. The PANAS (Positive Affect Negative Affect Schedule) scale developed by Watson et al. (1988) was used to assess the affective state or mood of the individual. The PANAS scale is designed to measure both positive affect (PA) and negative affect (NA). Ten items measured positive mood and ten items measured negative mood. Subjects indicated the extent to which that day they experience each mood state such as “active”, “determined”, “upset” and “nervous” on a 5-point scale ranging from “very slightly or not at all” to “extremely”. Likewise, the scales of both dimensions were scored such that higher numbers refer to higher qualities. Participants were asked to fill them out every time before they were observed for their typical performance. The Cronbach’s alphas of the scales for the data in this study were .84 (positive mood-typical 1), .90 (negative mood-typical1), .81 (positive mood-typical2), and .90 (negative mood-typical2).

Trait Affect. The variables of positive trait affect and negative trait affect were measured with items from the BIS/BAS (Behavioral Inhibition System and Behavioral Activation System) Scales which were developed and validated by Carver and White (1994). According to Gray (1990), BIS underlies inhibiting behaviors and affects toward goals because such goals may cause other negative or painful results; BAS is another dimension of brain functioning which directs behaviors towards goals and produces

positive feelings when exposed to reward. Specifically, seven items from BIS measured negative trait affect, including “I worry about making mistakes” and other items measuring the experience of negative feelings such as fear, anxiety, frustration, and sadness; five items from BAS Reward Responsiveness, four items from BAS Drive, as well as four items from BAS Fun Seeking were used to measure positive trait affect, including “when I get something I want, I feel excited and energized”, “I go out of my way to get things I want”, “I crave excitement and new sensations”, and other items measuring the experience of positive feelings such as hope and happiness. Participants were asked to respond based on 4-point scales, with 1 being “strongly agree” and 4 being “strongly disagree” and higher scores meant higher qualities. The Cronbach’s alphas of the scales for the data in this study were .58 (BIS), .70 (BAS Reward Responsiveness, 1 item — “When good things happen to me, it affects me strongly”— dropped to improve internal reliability), .51 (BAS Drive). Since the reliabilities for BIS and BAS Drive were too low to conduct further analysis, factor analyses were operated for us to look at if there were underlying factors with higher reliabilities. The results showed no improvement in reliability for BAS Drive. In this case, the scale BAS Drive was dropped from measurement of positive trait affect. When three out of seven items were dropped (i.e. “I feel pretty worried or upset when I think or know somebody is angry at me”; “Even if something bad is about to happen to me, I rarely experience fear or nervousness”; “I have very few fears compared to my friends”), the reliability for BIS increased from .58 to .61, which was still low but acceptable.

Data Cleansing

Data from 2 participants showed that their maximum performances were lower than their typical performances, which might not be error based on Klehe et al.'s (2007) argument and finding concerning the moderating effect of self-efficacy on maximum performance. Since such effect was not able to be demonstrated with analysis on the little size of data in this study, the data based on the two participants was disregarded. Consequently, results were based on 48 participants.

Results

First of all, the distinction between typical and maximum performance was examined. The mean speed of participants making sushi during the maximum performance period was 267/30 minutes, compared with 122/30 minutes during the typical performance period. A *t*-test for paired samples showed the difference between the means was significant, $t(47) = 11.46, p < 0.001$, 1-tailed. The effect size as measured by *d* was 1.51, a value corresponding to a large treatment effect. Thus, each participant's maximum performance was significantly different and higher than his/her typical performance. In addition, a strong linear correlation was found between the variables, $r = 0.48$, that was highly significant, and $F(1, 46) = 0.48, R^2 = 0.23, p < 0.005$, which also revealed a significant difference between typical and maximum performance.

Data Transformation

In order to examine what factors might influence the level of difference between typical and maximum performance within individuals, we needed to calculate each participant's discrepancy level between the two types of performance as dependent variable in the first place. One effective solution was to use the Intra-individual Coefficient of Variation (ICV), defined as the ratio of the standard deviation to the mean (Lecerf, Ghisletta, & Jouffray, 2004). In this data set we operationalized typical performance as the mean, maximum performance as the statistical maximum of each participant's performance distribution. Accordingly, discrepancy level between typical and maximum performance within an individual equaled to (maximum-typical)/typical and higher scores referred to higher level of discrepancy. In this study, the dependent variable was normally distributed (Kurtosis = -.31).

Test of the Hypotheses 1-5

Regression analysis was used to test hypotheses 1-5 presented in this study.

First of all, we respectively put demographic variables such as age, working experience as a sushi chef as control variables into the zero-order regression analysis for job tenure and found that job tenure in the participating restaurant was significantly correlated with the dependent variable ($\beta = -.34, p < .05$), indicating that relevant working experience can reduce the difference between typical and maximum performance within an individual. Therefore, Hypothesis 1 was supported. We also used *t*-test for two independent samples to examine whether gender could be a factor affecting

the dependent variable, and the result did not show a significant effect ($F(1, 46) = 0.86, n. s.$).

Hypothesis 2, which proposed that the difference between typical and maximum performance for the individuals scoring high in Conscientiousness dimension would be less than that for people scoring low in this dimension, was tested with a regression analysis that used Conscientiousness as the predictor variable and job tenure as a control variable. However, the result was not significant ($F(2, 45) = 3.42, p < .05, \beta = .14, p_r = .15, n. s.$). Therefore, Hypothesis 2 was not supported.

To test whether Emotional Stability significantly correlated with the level of difference between typical performance and maximum performance through the mediation of self-regulation (Hypothesis 3a and 3b), first of all, we regressed the dependent variable (typical/maximum performance discrepancy) on the independent variable. However, the independent variable was not correlated with the dependent variable ($\beta = 0.02, F(1, 46) = 0.04, n. s.$), which indicated that Hypothesis 3a was not established. In this case, we could not proceed with the mediation test for Hypothesis 3b. This result also indicated that self-regulation was not a significant mediator between emotional stability and the dependent variable. Here, Hypothesis 3b was not supported either. But we could still test the relationship between Emotional Stability and self-regulation and the relationship between self-regulation and the intra-individual typical/maximum performance discrepancy level in separate regression analysis. Results showed that Emotional Stability was highly correlated with self-regulation ($\beta = .37, F(1, 46) = 7.07, p < .05$), and self-regulation was marginally significantly related to the dependent variable after job tenure was controlled ($F(2, 45) = 4.22, p < .05$) although the

direction was unexpected ($\beta = .22$, $R^2 = .16$, partial $p = 0.07$, 1-tailed). Nevertheless, the result did show that self-regulation contributed to intra-individual level of discrepancy between typical and maximum performance.

Hypothesis 4a stated that positive trait affect in the form of behavioral approach system (reward reaction and drive) would decrease the difference between typical and maximum performance within an individual. Since BAS Drive scale was dropped due to low reliability, we only regressed the dependent variable on the reward reaction scale of behavioral approach system, and the result indicated that the effect of BAS Reward Response was not significant ($\beta = -.23$, $F(1, 46) = 2.65$, *n. s.*). Hence, Hypothesis 4a was not supported.

Hypothesis 4b proposed that the difference between typical and maximum performance for the individuals who have low negative trait affect would be less than that for people who have high negative trait affect. After job tenure was controlled, a significant relation was found with a regression analysis ($F(2, 45) = 7.47$, $p < 0.01$). However, the relationship was negative ($\beta = -.37$, $R^2 = .25$, partial $p < 0.01$, 1-tailed), which means that the higher the negative trait affect is, the smaller the difference (typical vs. maximum) is. Accordingly, Hypothesis 4b was not supported.

Since we measured twice state affect or mood in correspondence to typical performance measurement, we used Discrepancy Level 1 (equals to (Maximum-Typical1)/Typical 1) and Discrepancy Level 2 (equals to (Maximum-Typical2)/Typical 2) as dependent variable in two separate regression analyses to examine if mood could affect the level of difference between typical and maximum performance. However, neither positive mood nor negative mood was significantly correlated with the dependent

variable in the Discrepancy Level 1-PA1NA1 analysis ($F(2, 45) = 0.48, p > 0.5$, partial $ps > 0.1$) as well as in the Discrepancy Level 2-PA2NA2 analysis ($F(2, 45) = 0.16, p > 0.5$, partial $ps > 0.5$). Therefore, Hypothesis 5a and Hypothesis 5b were not supported.

Table 2

Means, Standard Deviations, and Correlations between Variables

Dependent Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Typical 1	119.78	46.33													
2. Maximum	267.21	109.73	.51**												
3. Typical 2	123.55	54.61	.67**	.38**											
4.LD	1.36	1.04	-.33*	.53**	-.44**										
5.Tenure	1.47	1.11	.35*	.02	.28	-.34*									
6.Conscientious	3.86	.71	.06	.19	.06	.15	-.02								
7.Emotional Stability	3.49	.77	-.13	-.04	-.02	.03	.21	.41**							
8.Self-regulation	3.40	.56	-.03	.15	-.09	.26	-.13	.74**	.37*						
9.BIS	2.62	.44	.11	-.23	.12	-.32*	-.15	-.28	-.57**	-.33*					
10.BASRR	3.34	.55	.23	-.01	.19	-.23	.04	.11	-.01	.15	.27				
11.PAI	3.16	.75	.02	.04	-.11	.16	.01	.19	-.29*	-.02	.21	-.06			
12.NAI	1.91	.86	-.08	.00	-.00	.09	-.23	-.21	-.49**	-.32*	.31*	-.35*	.23		
13.PA2	2.89	.69	-.00	.13	.01	.10	.05	.22	.04	-.05	-.02	-.09	.64**	.01	
14.NA2	1.89	.80	-.05	.11	.05	.15	-.08	-.45**	-.43**	-.47**	.26	-.37**	.25	.64**	.20

*.Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion

In the following section, the main findings and their interpretations shall be discussed. The contributions and limitations of the current study are subsequently presented, as well as practical implications and direction for future research.

This study tried to explore the predictors of the typical/maximum performance discrepancy level within individuals by investigating the underlying cognitive-motivation mechanism. As predicted, an employee's typical performance was significantly distinct from his/her maximum performance level, which was consistent with the previous literature. We observed that job tenure made a salient contribution to the level of difference between typical and maximum performance within an individual, suggesting that it may be useful to consider attentional resource as an important factor for the differentiation of typical versus maximum performance. The attentional resource utility is argued to differ among different tasks, occupations, professions, and organizations. It can depend on a lot of facts such as task demands on attentional resource, physical conditions, working hours, job knowledge, working environment, and so forth. As such, the performance discrepancy may not only be attributed to motivation, ability, or even both. Typically, when people work in a company, they have to do their jobs for eight hours, no matter if they are "willing" to or not. Eight-hour working time can largely consume or even deplete one's energy so as to drain his/her attentional resources easily. In this case, there is no more attentional resource "available" for job tasks and therefore working efficiency decreases, even if it's not about the level of motivation or job-related knowledge. The current study argues that people with higher job tenure tend to be more adapted to the task requirements for personal resources, capable of keeping working

efficiency to a relatively high level, and therefore have less intra-individual discrepancy between typical and maximum performance.

Personality Our second research question concerns the possible relationships between personality and intra-individual typical/maximum performance discrepancy level. It has been suggested that specific dispositional traits could reduce the performance discrepancy by maintaining relatively high level of typical performance. Indeed, quite a few studies have shown that Conscientiousness and Emotional Stability could predict one's job performance by relating either to work motivation or to cognitive processing during the work. However, the results in this study showed that neither significantly influenced the typical/maximum performance discrepancy. Post hoc analyses were conducted to examine whether these two personality traits affected participants' typical performance, and the results were not significant either. There is at least one possible reason for the difference between our findings and the results reported previously by other authors. In our view, it is important to examine the moderating effect of situational strength on the relationship between personality and job performance. Situational strength has been conceptualized as a force deriving from various situational characteristics that can restrain the expression of individual differences in work motivation and job knowledge and force the behavior among *all* people homogenized towards certain work standards (Meyer, Dalal, & Bonaccio, 2009). When these situational characteristics are absent, employees' behavior is more likely to be influenced by their *own* individual discretion; whereas the presence of these characteristics replace individual differences regarding potential motivation-cognitive information processing as the most prominent source guiding employee's work behavior (Meyer, Dalal, &

Bonaccio, 2009). Examples of “strong” situations include low work autonomy, close supervision, explicit policies and procedures, and government regulations, and it has been demonstrated that the criterion-related validity of Conscientiousness is higher under characteristically weak circumstances than otherwise (Meyer, Dalal, & Bonaccio, 2009). When applied to our study, situational strength is likely to attenuate the criterion-validity of Conscientiousness and Emotional Stability because the study setting for typical performance observation had strong enough moderating effect (e.g. close supervision, intensive serving demands during rush hour, open-kitchen to customers, etc.).

An equally plausible explanation could be that the task may have been too physically challenging in the typical working conditions, which might largely contribute to the typical/maximum performance discrepancies and counteracted the effectiveness of other predictive variables. Moreover, the performance context in which this study was conducted differs greatly from the performance measures typical in management research. The task of sushi making requires high manual dexterity and the physical endurance needed for long hours on one’s feet. Perhaps the physical nature of the task limited on the generalizability of previous findings. This possibility suggests that future research should explore the predictors of performance using more physically-oriented tasks.

Another possibility could be that participants “traded” quantity with the expense of relatively low quality. Participants may have implicitly taken more effort on accomplishing faster speed throughout the experiment because this component was the indicator of overall task effectiveness. It is also possible that the utility of the proposed framework may depend on the strength of correlations between typical and maximum performance ($r = 0.48$). Strong interrelationship made it more difficult for those potential

predictors to show significant effectiveness on performance variance when they were entered into the regression analyses.

Self-regulation We also observed the relationship between self-regulation and typical/maximum performance discrepancy with the proposition that high self-regulation would reduce the discrepancy level within individuals. Contrary to our expectation, the result revealed that people who scored high in self-regulation were more likely to have higher discrepancy level between typical and maximum performance. This finding indicates that self-regulation tends to affect task performance in maximum conditions much more than in typical working conditions. One possible reason is that albeit the short task duration under maximum conditions facilitated participants to focus on work, the presence of observation and evaluation from the researcher under maximum conditions had more detrimental effects than other external factors derived from relatively long task duration under typical conditions. The detrimental effects may have acted to distract participants subconsciously, therefore decreasing the attentional resource put on the task. It is possible that self-regulation skills can minimize such detrimental effects by regulating participants to focus on task without being disturbed and more self-regulation skills are needed under maximum working conditions than under typical working conditions. Although in this study self-regulation was not significantly related to either maximum or typical performance, the results did show an intriguing difference in the correlation coefficients of self-regulation on maximum performance (.15) and on typical performance (-.07). Concerning the nonsignificant relations with typical and maximum performance, it is argued that self-regulation exerted little influence on performance when performing simple tasks (Bond, 1982). Besides that, the nonsignificant relationship

of self-regulation with maximum performance might also be attributed to the strong effects of external motivational variables on performance under maximum working situations. Nevertheless, the finding supports the notion that typical/maximum performance discrepancy, independent of typical and maximum performance, may be a different construct with different antecedents than typical performance or maximum performance alone.

Affect Our third research question concerns the relationships of affect with performance discrepancy. Our prediction was that negative affect (both trait and state) would lead to larger discrepancy level while positive affect (trait as well as state) would contribute to lesser discrepancy level. However, the nonsignificant results failed to support our hypotheses. The possible reasons for personality regarding situational strength, physical challenging task, and quantity/quality trade off, seem also fit in this situation. The only exception was represented by a significant *negative* relationship between negative trait affect and performance discrepancy, meaning that higher score in negative trait affect lead to lower discrepancy level. This finding is not really in conflict with previous literature. In fact, Johnson et al. (2010) reported an nonsignificant relationship of negative trait affect (NA) with task performance when using an *explicit* measurement of NA. Jordan et al. (2006) also reported a significant and positive relationship of negative mood with team performance. Carver and Scheier (1998) argued that the experience of negative affect may sometimes aid performance because it facilitates the perception of performance-goal discrepancy so as to devote more effort on task activities to reduce such discrepancy. Nevertheless, our finding was consistent with theorists who have proposed that relationships involving negative affect are more complex and

therefore latent mediators are needed to identify for the future studies examining the relationships between trait affect and job performance (Johnson, Tolentino, Rodopman, & Cho, 2010).

Concerning the nonsignificant results on the relationships between other affect variables and typical/maximum performance discrepancy as well as the low reliability of trait NA measurement, it is reasonable to consider that the self-report measures containing explicit straightforward items provided respondents the opportunity to distort their answers in a way to paint a more favorable or desirable picture of themselves, and thus seem susceptible to faking. In this case, more *implicit* measurement is called for in the future research.

Contributions

This paper contributes to the existing literature of typical-maximum performance in three ways. Firstly, given the small number of empirical studies published on typical and maximum performance (Klehe, Anderson, & Viswesvaran, 2007), we accumulated a number of studies adopting different perspectives and research paradigms on the typical versus maximum performance literature. In response to Klehe et al.'s (2007) appeal for more empirical research conceiving typical-maximum performance as a potentially valuable typology in various occupations, industries, and cultures, this study adds to the existing typical-maximum performance theory by positing that such performance discrepancy can also occur among job roles as sushi chef in Asian culture.

Secondly, this study extended the typical-maximum performance distinction by including performance variability and by attempting to comprehend the antecedents and

mechanisms underlying the intra-individual performance variability with the help of empirically proven concepts such as Five-Factor Model of Personality and Affectivity, as well as with the aid of different well-developed theories like goal setting theory, expectancy theory and cognitive-processing models. Although the fit between these different literatures did not seem to be clear at first, the idea of linking and integrating different related theories is useful for us to deeply understand the conceptualization of typical-maximum performance, build up theory, and create coherent empirical research programs (Klehe, Anderson, & Viswesvaran, 2007).

Last, but not the least, results from this research are in accord with a possible theoretical overlap of typical versus maximum performance and attentional resource utility. This study attempted to explain the typical/maximum performance discrepancy within individuals from the perspective of different attentional resource utility levels in the two types of task conditions, which was a brandnew perspective for the literature and had significant practical implications. The present study argues that because of individual differences in attentional resources derived from ability, working experiences, and other personal characteristics, people react differently to the task nature and conditions (novel vs. usual; spaced vs. intensive; resource-sensitive vs. resource-insensitive), which further influences the intra-individual discrepancy level between typical and maximum performance. This study therefore contribute to the literature on typical-maximum performance through its consideration of attentional resource discrepancy, thus enriching the revelant literature.

Limitations

There are several potential limitations of this study necessary for caution. The first limitation is about the sampling issues, which include small sample size ($N = 48$), use of a convenience sampling technique instead of random sampling, and a rather small sample size for pilot study ($N = 5$).

The second limitation is concerning the issues pertaining to manipulation of contextual factors on an individual's level of typical performance. These factors include opportunities to perform (the number of customers and item orders, even though we have tried to minimize such influence by choosing rush hour for observation), number of coworkers with similar job roles, performance of coworkers, and resource availability (with or without help of equipments). However, we believe that, given the primary goal of their organization to maximize profit, employers have been able to make "wise" decisions on human resource allocation in order to make most profits with fewest employees. Such allocation is believed to aid us in contextual factor manipulations.

The third limitation relates to the potency of maximum performance measurement because of the fact that maximum performance was only measured once. Errors might exist therein regarding ineffective indicator of "potential" ability or optimal performance affected by internal or external factors like physical conditions at the observation moment and interruptions of phone calls, randomly walk-in customers, etc.

Despite these limitations, it is argued that the results from this study provide support for the assertion that typical/maximum performance discrepancy, independent of typical and maximum performance, has different constructs and antecedents, as well as

limited support for the case that individual differences in dispositional traits and motivational skills can have a significant and differential impact on outcome variables.

Practical Implications

Although we found weak evidence for the expected relationships among dispositional traits, motivational skills, and performance discrepancy, our results do support the potential utility of the proposed framework. It is suggested the usefulness to consider performance discrepancy in addition to typical and maximum performance when employers value employees' performance, as such a discrepancy can be very disruptive for organizations' success (Barnes & Morgeson, 2007) and "has implications for the validity of performance appraisals, personnel selection decisions, job design, and work assignments" (Mesmer-Magnus & Viswesvaran, 2007, p. 206). The findings in this study also indicated the low criterion-related and external validities of many predictors of job performance such as personality, affect, and ability. Although organizations and human resource managers could benefit from the ability and dispositional differences to predict one's tendency to perform at potential level, they might make mistakes in neglecting candidates (e.g. with low self-regulation or high negative trait affect) who performed poorly under maximum conditions but would have been excellent performers on the daily job with much less typical/maximum performance discrepancy, or in choosing those who scored high on tasks with short-duration in test conditions but would have limited attentional resources allocated on the job demanding long-time persistence and have larger typical/maximum performance discrepancy. Similarly, it is important for supervisors to know what factors affect subordinates' behavior and performance when

scheduling and assigning them for tasks under different conditions. Furthermore, different organizations value different conceptions of performance. For those organizations who believe that they are capable of providing mechanisms and creating work context for employees to work close to their potential over the long run, selection systems ought to be designed to predict candidates' maximum performance; On the other hand, for such organizations that are not planning to make a lot of attempts to change people once hired, they should make selection decision to predict typical performance (Sackett, 2007). However, problems may still exist by practicing in either way. For organizations that make selection decisions based on the former logic would possibly cost a lot to establish such mechanisms and still lose potential excellent performers with relatively low maximum performance but little typical/maximum discrepancy and without necessarily being invested that much in this aspect by the organization; while for organizations only focusing on typical performance predictors may miss those candidates with good potential. Thus, the proposed framework of intra-individual typical/maximum performance discrepancy is useful for organizations to examine the effectiveness of their present selection systems and design valid and cost-efficient policies and procedures aimed at helping employees to realize their potential and shrinking the gap between typical and maximum performance. Put in the specific sushi restaurant situation, this proposed framework suggests that job tenure is an important factor for managers to take into consideration when making decisions on compensation of employees. Moreover, specific dispositional traits should also be considered in combination with job sample test as well as specific management system during the selection of new employees.

Future Research Directions

The results of the current study suggest numerous needs for future research. One need is to identify the range in the degree to which individuals approach at or differ from their maximum performance among various cultures, industries, professions, occupations, and task complexities. This study found a strong interrelationship between typical and maximum performance among Asian sushi chefs performing relatively simple and physical-oriented tasks at an entry-level job in a competitive environment. More studies are needed in the future using participants from different cultures, more complicated and physical-oriented tasks, higher occupational levels, as well as industries involving monopoly. The second need is to identify the determinants and moderators of performance variation in a given domain. This study found job tenure, self-regulation and negative trait affect were significant predictors of performance discrepancy in one specific domain. Moreover, it is argued that performers had low intrinsic motivation in their job in this study. Questions may be asked whether these predictors can still be effective in other fields. It is believed that moderators exist affecting the degree of discrepancy, like self-efficacy and intrinsic motivation. If the link with mechanisms of attentional resource utility still holds true in other domains, there is also need for future research introducing known moderators from the relevant literature as possible moderators on the level of typical-maximum performance discrepancy within individuals in a given field.

Conclusion

This field study examined the predictive validity of personality and affect on the task performance discrepancy level (quantitative) within individuals. The main findings of the study included a significant main effect for self-regulation and for negative trait affect on the organizational outcome. The results showed that self-regulation had a positive effect while negative trait affect had a negative effect on intra-individual performance discrepancy. Thus, the findings of this study emphasize the role of performance variability independent from typical and maximum performance playing in the performance evaluation, and also the importance of dispositional differences in predicting the range in the degree of such performance discrepancy.

The results of this study also provide implicit support for the argument of attentional resource utility in determining the difference between typical and maximum performance.

The findings from this study invite future research for a refinement of typical-maximum performance theory, and have practical implications for organizations to develop their personnel selection and training systems.

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