

Psychological Factors of Gendered Career Choices: Examining Gender Stereotypes, Self-Efficacy, and Interests

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Abstract: The current study aimed to examine the psychological mechanism of the gender division of labor. Study 1 assessed gender stereotypes for each male and female-dominated and gender-balanced occupation in terms of masculinity and femininity. Analyses of data from 652 Japanese college students, aged 18–24 years, demonstrated that occupations with high proportions of men and women were stereotyped as masculine and feminine, respectively. Study 2 analyzed data from 657 Japanese men and women, aged 20–60 years, and illustrated that men and women were more interested in the social and realistic domains, respectively. However, self-efficacy in realistic and social activities mediated realistic and social interests, respectively. Additionally, women's interest in the realistic domain was influenced by self-efficacy in male-dominated fields. Lastly, the study discussed the practical implications for career education and support based on these findings.

Introduction

Gender equality is one of the 17 Sustainable Development Goals, and Asia-Pacific countries are working hard to achieve this goal. Japan is no exception and is being proactive in implementing measures for gender equality, including the Basic Act for Gender Equal Society (1999), the Basic Plan for Gender

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Equality (2000), and the Act on Promotion of Women's Participation and Advancement in the Workplace (2016), which are reviewed every five years. However, in a recent report by the World Economic Forum (2022), Japan ranked 116th out of 146 countries, which clearly indicated that Japan was not making progress in gender equality compared with other countries. The ranking for economic participation and opportunity is even lower at 121st with a score of 0.564 (perfect equality = 1). This rank indicates that Japanese women are more economically inactive than men. Moreover, gender division is evident in the occupational fields; the Ministry of Internal Affairs and Communications (2015) reported that more than 90% of mechanical engineers, occupational sports personnel, security personnel, and automobile maintenance and repair personnel are men. Alternatively, more than 90% of nurses,

dietitians, kindergarten teachers, and home care workers are women, which suggests that horizontal segregation by gender remains in the Japanese labor market. Gender division is also evident in the industry. For example, according to the latest national census, 20% of men work in the manufacturing industry compared with 11% for women. Moreover, 11% of men are engaged in the construction industry compared with only 2.9% of women. Alternatively, the largest number of women is engaged in health and welfare, which accounts for 22.6% of the total, and only 6.0% of men are engaged in this sector (Statistics Bureau, Ministry of Internal Affairs and Communications, 2022).

Against this background, the present study focuses on the phenomenon of the gender division of labor in contemporary Japanese society and examines its psychological determinants such as occupational gender stereotypes, self-efficacy, and interests. Occupational gender stereotypes that men and women play gender-specific roles and the low self-efficacy for the occupational roles considered appropriate for the opposite gender are key concepts for explaining the reasons why few people pursue non-traditional careers (Hackett, 1995). To obtain clues, the current study consists of two parts. Study 1 extracts male and female-dominated and gender-neutral occupations on the basis of the ratio of men-to-women in the current workforce and analyzes the relationship between occupational gender dominance and occupational gender stereotypes. Study 2 focuses on the social and realistic domains, where the gender gap is evident, and investigates the mediating effect of self-efficacy on processes that lead to gender differences in interest.

Study 1

Gender Stereotypes and Their Influence

Gender stereotyping is a relatively fixed, overly simplified concept of attitudes and behaviors considered normal and appropriate

for a male or female in a particular culture (“Gender stereotype, n.d.). It is formed in early childhood and is associated with occupations; according to the theory of circumscription and compromise (Gottfredson, 2005), children become gender role oriented between the ages of 6 and 8 years and begin to recognize that occupations belong to one gender instead of the other. During this period, person–job matches are determined in terms of gender appropriateness. For example, firefighters, truck drivers, and doctors and nurses, teachers, and secretaries are jobs for men and women, respectively. Even if a child is interested in any job, many options are eliminated, because they are considered inappropriate for their gender (Gottfredson, 2005). The influence of gender stereotypes is also evident in the school setting. In a study on middle school students, gender-inappropriateness, such as boys and girls who excel in music and physics, respectively, was perceived as leading to less popularity for these students in class (Kessels, 2005). Gender stereotypes also exert an unmitigated influence on future career plans. Gender stereotypes among adolescent girls that men are better at mathematics than women are negatively associated with their intentions to work in mathematics careers through negative competence beliefs (Song et al., 2017).

Gender stereotypes not only prevented women from entering the male domain but also negatively influenced the career choices of men. Barriers that hinder men from entering female-dominated jobs mirror those that hinder women from entering gender-atypical jobs. Moreover, gender stereotyping from an early age that continues into adulthood is the major barrier that prevents men from entering the women’s sphere such as care, teaching, nursing, and nurturing (Fagan & Norman, 2013). In addition to individual career choices and selection processes, gender stereotypes exaggerate the perceived boundaries between men and women and influence the manner in which people perceive performance and judge abilities

according to gender (Ellemers, 2018). Given these findings, gender stereotyping is an important factor that influences career development throughout the lifelong careers of individuals from confidence and interest building to choice behavior, job performance, and recognition once one begins working.

Gender Ratio as a Determinant of Gender Typing

Numerous studies accumulated data on the process of stereotype formation based on social role theory. Eagly and Steffen (1984) investigated gender stereotypic beliefs about homemaker and employee roles and found out that homemakers were perceived as more communal, and employees were perceived as agentic. Subsequent studies demonstrated that people formed gender stereotypes that reflect their perceived gender dominance in various occupational fields. In particular, these stereotypes exceeded the traditional social roles of women as homemakers and of men as employees. For instance, using 10 occupations ranging from male to female-dominated ones, Cejka and Eagly (1999) confirmed that perceptions about the gender distribution of occupations were closely related to the actual men-to-women distribution. Moreover, Koenig and Eagly (2014) described humans as social perceivers and explained the process of the formation of gender stereotypes, that is, social perceivers observe that members of a particular group occupy certain social roles more than members of another group, then generalize the typical behavior of group members in a particular social role to the group as a whole. In Japan, Ikkatai et al. (2021) conducted a survey on stereotypes in physics, which is one of the male-dominated fields, and reported that people who encounter fewer female examples in physics display a tendency to recognize jobs in physics as masculine. These phenomena can be interpreted as people perceiving whether or not the majority of individuals in certain occupations are men or women and incorporating this gender information.

Afterward, they formed gender stereotypes, that is, certain occupations are masculine, whereas others are feminine in nature (Adachi, 2013; 2017). This psychological mechanism enables the reproduction of existing occupational gender division. Olsson and Martiny (2018) pointed out that in the process of internalizing gender-congruent aspirations and behavior, the existing disproportionate low share of women in various occupational fields acts as a psychological barrier to women's attempts to enter male-dominated academic and high-status professional fields. Alternatively, people need to understand the impact of gender stereotypes and social sanctions incurred for failure to conform to gender norms to understand men's underrepresentation in traditionally female-dominated domains (Manzi, 2019). To summarize the discussion, the current study inferred that occupational gender segregation can be attributed to the formation of gender stereotypes, which reflect the skewed men-to-women composition in the current job market.

Aims and Hypotheses

Study 1 aims to examine the relationship between gender ratios and occupational gender stereotypes. Following the abovementioned argument that gender stereotypes reflect unequal gender distribution in the real job market, the study hypothesizes that occupational fields with more men gain more masculine-typed images and fewer feminine-typed images compared with those of other fields (Hypothesis 1). Alternatively, occupational fields with more women gain more feminine-typed images and fewer masculine-typed images compared with those of other fields (Hypothesis 2).

Method: Participants

The study invited registered survey monitors of Cross Marketing, a web-based research company in Japan, to participate in the study. In the screening phase, the study selected and recruited male and female undergraduate students aged between 18 and 24 years, who never worked full-time, to the web survey. On

the first page, the researcher explained the purpose of the research and that participation was voluntary, the survey was anonymous, and the respondents could withdraw anytime during the survey, as well as data handling methods. Only individuals who understood the objective of the study, the conditions of participation, and provided consent to participate were directed to the survey. The participants earned redeemable points upon completion of the survey. Data was collected to ensure that gender and grade ratios were as equal as possible. Valid responses were obtained from 652 Japanese college students (female: 52.45%; mean age: 20.31 years, $SD = 1.36$). In terms of year levels, 25%, 24%, 25% and 26% were freshmen, sophomores, juniors, and seniors, respectively.

Instrument: Identifying Occupations

First, the study classified 144 occupations from the 2020 Basic Survey on Wage Structure (Ministry of Health, Labour and Welfare, 2021) by applying the following criteria: less than 30% of women were male-dominated, less than 30% of men were female-dominated, and less than 40% of gender differences were gender-balanced. Based on these criteria, the study identified 85 (59%) as male-dominated, 19 (13%) as female-dominated, and 40 (28%) were gender-balanced occupations. The male-dominated occupational fields covered the 11 major groups of the Japan Standard Occupational Classification,¹ whereas the gender-balanced fields were composed of only six (b, c, d, e, h, and k). Lastly, the female-dominated fields covered only four (b, c, d, and e). As a next step, the study extracted 10 occupations for each male and female-dominated and gender-balanced jobs by considering the major groups,

representativeness, and familiarity with those without work experience. The Appendix lists the extracted 30 occupational titles, gender ratios, and corresponding major groups.

Occupational Gender Stereotypes

Using the extracted 10 occupational titles for each male and female-dominated and gender-balanced field, the study assessed masculine and feminine typing using a five-point rating scale ranging from 1 (*not masculine at all*) to 5 (*very masculine*) and from 1 (*not feminine at all*) to 5 (*very feminine*), respectively. Cronbach's alpha (α) for the current sample ranged from .658 to .897.

Data Analysis

The study employed statistical software HAD (Shimizu, 2016) for data analysis. The masculinity and femininity scores for the male and female-dominated and gender-balanced fields were calculated by computing the average of 10 occupations. To test for the hypotheses, the study conducted two-way mixed-design ANOVA on the masculinity and femininity scores using a 2(gender) $\times$ 3(occupational gender dominance) design. As an index of effect size, the study calculated for partial eta-squared (η_p^2).

Results

The result of two-way mixed ANOVA on the masculinity scores pointed to the significant main effects of gender ($F(1, 650) = 18.57, p < .001, \eta_p^2 = .03$) and occupational gender dominance ($F(2, 1300) = 1386.35, p < .001, \eta_p^2 = .68$), whereas the interaction did not reach significance. As for the main effects of occupational gender dominance, multiple comparisons adopting Holm–Bonferroni method indicated that male-dominated fields exhibited the highest score ($M = 3.79$) followed

¹ The Japan Standard Occupational Classification of major groups, which is provided by Ministry of Internal Affairs and Communications (2009), include (a) administrative and managerial, (b) professional and engineering, (c) clerical, (d) sales, (e) service, (f) security, (g) agriculture, forestry, and fishery, (h) manufacturing process, (i) transport and machine operation, (j) construction and mining, and (k) carrying, cleaning, packaging, and related workers.

by the gender-balanced fields ($M = 3.01$), whereas female-dominated fields exhibited the lowest score ($M = 2.42$). Although the effect size of gender was small, women produced slightly higher scores ($M = 3.13$) than men ($M = 3.01$). This result implied that the male-dominated fields gain more masculine images, whereas fields dominated by women presented fewer masculine images. In addition, women were slightly more likely than men to exhibit masculine occupational images. In terms of femininity, the study noted a significant interaction between gender and occupational dominance ($F(2, 1300) = 7.15, p = .005, \eta_p^2 = .01$). The test for the simple main effect on occupational dominance and subsequent multiple comparisons, which adopted the Holm–Bonferroni method, indicated that female-dominated fields produced the highest score (men: $M = 3.65$; women: $M = 3.71$) followed by gender-balanced fields (men: $M = 3.09$; women: $M = 3.16$). In contrast, male-dominated fields exhibited the lowest score (men: $M = 2.41$; women: $M = 2.30$). Moreover, the simple main effect test on gender indicated that men displayed higher scores than women for male-dominated fields. However, the effect size of gender was relatively small ($\eta_p^2 = .01$) compared to occupational dominance (men: $\eta_p^2 = .62$, women: $\eta_p^2 = .68$). This finding implied that fields dominated by women gain more feminine images, whereas those dominated by men display fewer feminine images. Additionally, men were slightly more likely than women to perceive the male-dominated fields as feminine. These results on the masculinity and femininity scores supported Hypotheses 1 and 2.

Discussion

Study 1 aimed to examine the relationship between gender dominance in occupational fields and gender stereotypes. As hypothesized, occupational fields with more men gained more masculine images and fewer feminine images, whereas those with more women gained more feminine images and fewer masculine images. The result supported the claims that the

gendered mental images of occupations are consistent with the gender distribution of the actual occupational structure (Adachi, 2013; 2017; Cejka & Eagly, 1999), that men and women are nonrandomly distributed according to social roles, and that biased distribution led to gender stereotypes (Koenig & Eagly, 2014). Additionally, Koenig and Eagly (2014) insist that masculine and feminine stereotyping leads to the perception that one needs to possess masculine qualities, such as competitiveness, dominance, and aggressiveness, to do well in male-dominated occupations. Conversely, one needs to possess feminine attributes, such as gentleness, nurturing, helpfulness, sociability, and supportive, to do well in female-dominated fields (Koenig & Eagly, 2014). Gender stereotyping due to unequal gender distribution deter women and men from pursuing nontraditional jobs (Fagan and Norman, 2013). In other words, gender stereotypes do not only denote masculine or feminine images but also influence ideas about which persons are suitable and which attributes are adaptive. Then, developing self-efficacy in areas with opposite gender images is difficult and leads to restraint in the development of interests, which, in turn, limits the range of occupational choices. Therefore, Study 2 focuses on self-efficacy for single-gender-dominated fields and examines the relationship among gender, self-efficacy, and interests.

Study 2

Social and Realistic Interests and Gender Differences

Holland (1959) proposed the Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC) codes to understand personal and environmental congruence and to support individuals in their career choices and development. Holland's hexagon model structure is applicable to various cultural contexts. Moreover, gender differences in interests in RIASEC are demonstrated in diverse

populations (Nauta, 2013). For instance, in a survey of middle school students in Eastern Europe, female students possessed higher social and artistic interests than male ones, whereas male students possessed higher realistic interests and displayed more interest in Science, Technology, Engineering, and Mathematics (STEM) occupations than women, which indicates greater gender gaps in technology and engineering (Babarović et al., 2019). Even research in Iceland, which holds the top position in gender equality rankings (World Economic Forum, 2022), illustrates that the level of realistic interests is higher for men than for women, whereas women displayed higher levels of social interests than did men (Einarsdóttir & Rounds, 2020). In terms of relationships with occupations, women displayed interest in social fields, such as teaching, counseling, and welfare services, whereas men focused on traditional skilled trades, such as carpentry, mechanics, and electronics, which reflect gender segregation in the Nordic labor markets (Einarsdóttir & Rounds, 2020). A meta-analysis of gender differences in interests documented that men are more interested in the realistic and investigative domains, and women are more interested in artistic, social, and conventional fields. Additionally, the most obvious gender difference in occupational interests is a separation through the object–people dimension, where men and women display preferences for object and people-oriented careers (Su et al., 2009). In light of previous studies, the current study assumes that a significant and consistent gender difference exists in the interests of interpersonal-oriented social and object-oriented realistic domains, which are located diagonally and are distant from each other in Holland’s hexagon model.

Meanwhile, in Japan, a study on Japanese college students in six majors (i.e., science, law, commerce, economics, medicine, and literature) also reported that female students were more interested in the social domain than male students. Moreover, male students were more

interested in the realistic and conventional domains than female students (Long et al., 2006). In terms of the current gender distribution of occupations in Japan, those with high percentages of women are more likely to require care skills and are less likely to require mathematical, technical, and managerial skills (Uchikoshi et al., 2021). As noted in the Introduction, men in the Japanese labor market occupy the majority of realistic domains, such as mechanical engineers and repair personnel, whereas women occupy the majority of interpersonal and social occupations such as nurses, dietitians, and kindergarten teachers (Ministry of Internal Affairs and Communications, 2015). The gradual entry of men in the social domains and women in the realistic domains is consistent with the world phenomenon that women are underrepresented in STEM fields, and men do not enter the healthcare, elementary education, and domestic (HEED) fields (Tellhed et al., 2017). Therefore, Study 2 focuses on the social and realistic domains, where gender differences are particularly large and consistent with the six domains by Holland, and where a gap exists in gender occupancy in diverse socio-cultural contexts.

Self-Efficacy as a Mediator

Self-efficacy is defined as the subjective perception of one’s capabilities to organize and execute courses of action required to attain the desired results. It is a judgment of what one can do with whatever skills one possesses and is a primary determinant of motivation and choice behavior (“Self-efficacy,” n.d.; Bandura, 1986). Gender differences in a career choice are described using the different accesses and availabilities of informational sources pertinent to the development of self-efficacy (Hackett & Betz, 1981). For instance, women obtain more opportunities to perform successfully in stereotypical feminine roles than in masculine roles. Additionally, within traditionally masculine performance domains, women gain fewer opportunities to try and succeed. Despite

their success, women fail to attribute this success to internal factors, which lead to lower and weaker levels of self-efficacy (Hackett & Betz, 1981). Social cognitive career theory formulates the process by which the personal aspect of gender influences career development through gender socialization and learning experiences (Lent et al., 1994; Lent & Brown, 2019). In the model, self-efficacy is posited as a mediator of career development, that is, the effects of gender on occupational interests are mediated by self-efficacy formed through past experiences, which vary by gender.

In the Asia-Pacific region, research on career choices that focuses on self-efficacy is conducted extensively. Examining Japanese undergraduates, Matsui et al. (1989) demonstrated that the levels of self-efficacy of women were lower than those of men in the realistic domain. Moreover, the study pointed out that women obtained fewer same-gender role models in this male-dominated domain and perceived the domain as masculine in nature. Also, women believed that they need masculine characteristics to be successful in this domain, which prevents the formation of self-efficacy. Adachi (2017) examined Japanese youth and reported that men and women possessed high levels of self-efficacy for occupations in which they observe the presence of more workers of the same gender. Yu and Hu (2022), who examined gender differences in the domain of information and communication technology (ICT), reported that self-efficacy and interest mediate gender differences in digital reading. In other words, female students are not innately poor at ICT; instead, they gain low levels of self-efficacy due to stereotyping computer use as male-dominated, which leads to the lack of interest and action. Chan (2022) examined gender disparities in self-efficacy, interests, and aspirations in STEM and reported that female students displayed significantly lower levels of self-efficacy than male students. The study also illustrated that self-efficacy in STEM was positively related to interest in STEM, and

interest was related to high levels of academic and occupational aspiration in STEM. On the basis of these findings, the current study assumed that realistic and social self-efficacies mediate gender difference in realistic and social interests, respectively.

Moreover, Tellhed et al. (2017) examined gender differences in educational choice and reported that gender difference in realistic and social ability beliefs partially mediates gender-skewed career choices. Additionally, the study found that female students dramatically differed from male students in terms of feminine versus masculine-typed competence ratings. The results suggested that men suffered less from doubts related to gender-stereotypical competence than did their female counterparts (Tellhed et al., 2017). Therefore, scholars presumed that self-efficacy in opposite gender-dominated fields as well as task-specific self-efficacy, mediate the gender difference in interests, especially among women.

Aims and Hypotheses

Study 2 aimed to test three hypotheses. Based on the previous discussion, the current study inferred that men are less interested in the social domain in which women were traditionally more active, whereas women are less interested in the realistic domain in which men were predominant (Hypothesis 1). However, the study also assumed that self-efficacy in social and realistic activities mediate the gender difference in social and realistic interests, respectively (Hypothesis 2). Lastly, the current study incorporated self-efficacy for nontraditional domains and presumed that self-efficacy in female and male-dominated fields mediate the gender difference in social and realistic interests, respectively, in which women exhibited more evident mediating effects. Furthermore, as a complementary analysis, Study 2 explores the generalizability of the results obtained in Study 1. Simply put, it examines whether the relationship between occupational gender dominance and gender stereotyping obtained from university students

can be replicated in a wide range of target populations.

Method: Participants

The study conducted a web-based survey using the same process used in Study 1. It invited registered survey monitors of Cross Marketing to participate in the survey. During the screening phase, the study selected male and female college students and full-time working adults who completed higher levels of education and set the age limit between 18 and 24 years old for college students and between 20 and 60 years old for working adults. Similar to Study 1, only participants who understood the objective of the survey, anonymity, spontaneity, and data handling methods and provided consent to participate were directed to the survey. Data was collected to ensure that the gender and occupation (college students/working adults) ratios were as equal as possible. Valid responses were obtained from Japanese participants aged 18 to 60 years ($N = 657$; 52.05%, females; mean age: 33.70 years; $SD = 14.67$).

Instruments: Occupational Gender Stereotypes

Masculine and feminine typing for male-dominated, female-dominated, and gender-balanced occupational fields was assessed using the scale developed in Study 1. Cronbach's alpha for the current sample ranged from $\alpha = .534$ to $.872$.

Occupational Self-Efficacy

Similar to the assessment of occupational gender stereotypes, 10 for each male-dominated, female-dominated, and gender-neutral occupations were adopted, and confidence for performing each occupation was assessed using a five-point rating scale ranging from 1 (*not confident at all*) to 5 (*very confident*). Cronbach's alpha for the current sample ranged from $\alpha = .816$ to $.897$.

Self-Efficacy for Realistic and Social Domains

Nine items for each realistic and social activity were adopted from the Vocational

Readiness Test (Japan Institute for Labour Policy and Training, 2006). Example items for the realistic activity included "assemble parts to make the machine" and "examine and repair car engines and brakes." Example items for the social activity included "visit homes and take care of elderly and disabled people" and "provide a service to passengers on the airplane." The participants rated their sense of confidence using a three-point rating scale: 1 = *not confident*, 2 = *neutral*, and 3 = *confident*. The Japan Institute for Labour Policy and Training (2022) reported Cronbach's alpha for realistic interest $\alpha = .88$, and social interest $\alpha = .82$, and Cronbach's alpha for the current sample was $\alpha = .91$ for realistic interest and $\alpha = .88$ for social interest.

Interests for Realistic and Social Domains

The same items as self-efficacy for realistic and social domains were adopted and interests for each activity were assessed by a three-point rating scale from 1 (*don't want to do*), 2 (*neutral*), and 3 (*want to do*). The Japan Institute for Labour Policy and Training (2022) reported Cronbach's alpha values of .90 and .85 for realistic and social interests, respectively. In the current study, these values are .88 and .83 for realistic and social interests, respectively.

Data Analysis

The study employed statistical software HAD (Shimizu, 2016) for data analysis. The study calculated for the means, SD, and correlations among the main variables and interpreted the correlations of medium ($r > .300$) and large ($r > .500$) effect sizes based on Cohen (1992). To analyze differences in masculine and feminine stereotyping and occupational self-efficacy according to gender and occupational gender dominance, the study performed two-way mixed ANOVA for the masculinity, femininity, and occupational self-efficacy scores using a 2 (gender) $\times$ 3 (occupational gender dominance) design. As an index of effect size, the study calculated for partial eta-squared (η_p^2). To test the hypotheses, the study conducted hierarchical regression analyses on

social (or realistic) interests. Furthermore, to separately test the effect of gender and self-efficacy, the study controlled for gender (0 = male, 1 = female) in Step 1; entered self-efficacy for social (realistic) activities in Step 2; and considered self-efficacy for female (male)-dominated fields in Step 3. Lastly, the study entered a two-way interaction between gender and self-efficacy for female (male)-dominated fields in Step 4. As indicators of effect sizes, the study also calculated for R-squared (R^2) and R-squared change (ΔR^2).

Results: Basic Statistics and Correlations

As described in Table 1, women displayed lower levels of self-efficacy for male-dominated fields ($r = -.34$) and realistic activities ($r = -.35$) than men. With regard to the relationships between self-efficacy and interests, self-efficacy for male-dominated fields and realistic activities exhibited positive high correlations with realistic interests ($r = .59$ and $.82$, respectively). Alternatively, self-efficacy for female-dominated fields and social activities produced positively high correlations with social interests ($r = .76$ and $.76$, respectively).

Table 1

	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Mean	—	3.87	2.23	2.95	2.23	3.82	3.15	2.67	2.70	2.84	1.66	1.79	1.74	1.82
(SD)	—	(0.53)	(0.46)	(0.30)	(0.51)	(0.51)	(0.29)	(0.82)	(0.79)	(0.69)	(0.56)	(0.51)	(0.55)	(0.50)
α	—	.87	.78	.57	.87	.84	.53	.90	.88	.82	.91	.84	.87	.83
a. Gender	—													
b. Masculine images for male-dominated field	.10 *	—												
c. Masculine image for female-dominated field	.11 **	-.46 **	—											
d. Masculine image for gender-balanced field	.03	.15 **	.43 **	—										
e. Feminine image for male-dominated field	-.08 *	-.72 **	.59 **	.12 **	—									
f. Feminine image for female-dominated field	-.07	.62 **	-.68 **	-.17 **	-.62 **	—								
g. Feminine image for gender-balanced field	-.02	.23 **	-.26 **	-.37 **	-.10 *	.51 **	—							
h. Self-efficacy for male-dominated field	-.34 **	-.08 *	-.05	-.06	.11 **	.03	.04	—						
i. Self-efficacy for female-dominated field	.22 **	.01	.06	.05	.03	-.03	.00	.54 **	—					
j. Self-efficacy for gender-balanced field	.04	.04	-.03	.01	-.01	.02	-.01	.71 **	.80 **	—				
k. Self-efficacy for realistic activities	-.36 **	-.08 *	-.04	-.05	.12 **	-.01	.05	.64 **	.25 **	.36 **	—			
l. Self-efficacy for social activities	.12 **	.00	.04	.10 **	.00	.01	.01	.29 **	.59 **	.42 **	.34 **	—		
m. Interests in realistic activities	-.35 **	-.09 *	.01	-.03	.14 **	-.03	.04	.59 **	.17 **	.29 **	.82 **	.22 **	—	
n. Interests in social activities	.18 **	.02	.11 **	.13 **	.03	-.01	.02	.15 **	.49 **	.30 **	.17 **	.76 **	.26 **	—

Note: Gender was coded as male=1; female=2

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

Comparison of Scores for Stereotypes and Self-Efficacy

Similar to Study 1, the study conducted two-way mixed ANOVA for masculinity, femininity, and occupational self-efficacy using a 2 (gender) $\times$ 3 (occupational gender dominance) design. In terms of masculinity, interaction was nonsignificant, whereas the main effect of occupational gender dominance was significant ($F(2, 1310) = 2176.69, p < .001, \eta_p^2 = .77$). The result of multiple comparisons using the Holm–Bonferroni method indicated that male-dominated fields produced high scores ($M = 3.87$) followed by gender-balanced fields ($M =$

2.95). In contrast, female-dominated fields obtained the lowest score ($M = 2.23$). Although the effect size was small, the main effect of gender was significant ($F(1, 655) = 15.83, p < .001, \eta_p^2 = .02$) with women obtaining slightly higher average scores ($M = 3.05$) than men ($M = 2.98$). The result suggested that occupational fields with more men display more masculine images, whereas fields with more women exhibit fewer masculine images and that women, slightly, tend to have more masculine images than men do. With regard to femininity, the study observed no significant interaction between gender and occupational gender dominance, while the main effect of

occupational gender dominance was significant ($F(2, 1310) = 1785.08, p < .001, \eta_p^2 = .73$) with female-dominated fields obtaining higher scores ($M = 3.82$), followed by gender-balanced fields ($M = 3.15$); male-dominated fields obtained the lowest score ($M = 2.23$). Though the effect size was small, the main effect of gender reached significance ($F(1, 655) = 10.99, p < .001, \eta_p^2 = .02$), which indicated that men obtained a slightly higher average score ($M = 3.10$) than women ($M = 3.04$). The result indicated that occupational fields with more women exhibit more feminine images, whereas those with more men display fewer feminine images and that men tend to have a more feminine image than women do. These results replicated the masculinity and femininity scoring trends obtained in Study 1.

The result of two-way mixed ANOVA on occupational self-efficacy noted a significant interaction between gender and occupational gender dominance ($F(2, 1310) = 255.37, p < .001, \eta_p^2 = .28$). A simple main effect test on occupational gender dominance and subsequent multiple comparisons, which adopted the Holm–Bonferroni method, indicated as follows. Men displayed a significantly higher score for male-dominated fields ($M = 2.97$) followed by the gender-balanced field ($M = 2.81$); female-dominated fields displayed the lowest score ($M = 2.52$) with an effect size of $\eta_p^2 = .27$. Conversely, women produced higher scores in female-dominated and gender-balanced fields ($M = 2.86$ and 2.86 , respectively) than in male-dominated fields ($M = 2.40$) with an effect size of $\eta_p^2 = .34$. A simple main effect test on gender indicated that men obtained significantly higher scores than women for male-dominated fields ($\eta_p^2 = .13$), whereas women displayed significantly higher scores than men for female-dominated fields ($\eta_p^2 = .05$). No significant gender difference was noted for the gender-balanced field. This result indicated that men and women possess high and low levels of self-efficacy for occupational fields dominated by one's and the opposite gender, respectively.

Conversely, the study observed no such gender effect for gender-balanced fields.

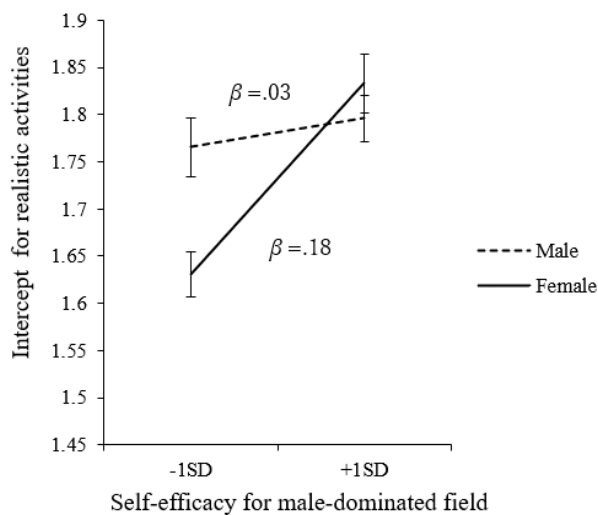
Relationship Among Gender, Self-Efficacy, and Interests

Table 2 presents the results of the hierarchical multiple regression analysis. In terms of the regression on social interests, Step 1 was significant ($R^2 = .03, p < .001$), and gender was a significant predictor of social interests in which men displayed lower levels of interest than those of women ($\beta = .18, p < .001$). Step 2 explained additional variance ($\Delta R^2 = .55, p < .001$), and self-efficacy for social activities presented a positive regression on interests ($\beta = .75, p < .001$). Alternatively, gender effect was reduced ($\beta = .09, p < .001$). Step 3, which added self-efficacy for female-dominated fields, and Step 4, which introduced the two-way interaction between gender and self-efficacy for female-dominated fields, did not show any significant improvement. The study adopted the same hierarchical regression model to examine the effects of gender and self-efficacy on realistic interests. Step 1 was significant ($R^2 = .12, p < .001$), and gender was a significant predictor of realistic interest with women showing lower levels than those of men ($\beta = -.35, p < .000$). However, gender difference was significantly reduced ($\beta = -.06, p < .001$) after adding self-efficacy to the realistic field ($\beta = .80, p < .000$) in Step 2 ($\Delta R^2 = .55, p < .001$). Step 3 obtained additional variance ($\Delta R^2 = .01, p < .001$), and self-efficacy in male-dominated fields displayed a significant regression ($\beta = .11, p < .001$) on realistic interests. In Step 4, variance slightly increased ($\Delta R^2 = .01, p < .001$) when the interaction between gender and self-efficacy for male-dominated field was entered. Figure 1 presents the following simple slope analysis, which revealed that self-efficacy for male-dominated fields did not influence realistic interests among men ($\beta = .03, p < .473$). Alternatively, it enhanced interests among women ($\beta = .18, p < .000$). On the basis of these results, the study considered Hypotheses 1 and

2 supported, whereas Hypothesis 3 was barely supported only among women.

Table 2

Dependent variable: Social interets		Step 1		Step 2		Step 3		Step 4	
Predictor		β	SE	β	SE	β	SE	β	SE
Gender (0=male, 1=female)		.18	.000	.09	.000	.08	.001	.08	.001
Self-efficacy for social activities				.75	.000	.72	.000	.72	.000
Self-efficacy for female-dominated field						.05	.148	.04	.172
Gender $\times$ Self-efficacy for female-dominated field								.04	.115
R^2		.03	.000	.58	.000	.58	.000	.59	.000
ΔR^2		.03	.000	.55	.000	.00	.148	.00	.115
Dependent variable: Realistic interets		Step 1		Step 2		Step 3		Step 4	
Predictor		β	SE	β	SE	β	SE	β	SE
Gender (0=male, 1=female)		-.35	.000	-.06	.015	-.04	.065	-.04	.065
Self-efficacy for realistic activities				.80	.000	.73	.000	.74	.000
Self-efficacy for male-dominated field						.11	.000	.11	.000
Gender $\times$ Self-efficacy for male-dominated field								.07	.001
R^2		.12	.000	.67	.000	.68	.000	.68	.000
ΔR^2		.12	.000	.55	.000	.01	.000	.01	.001



Discussion

The objective of Study 2 was to examine the relationship among gender, self-efficacy, and interests with a focus on occupational fields with significant gender differences. Prior to the main analyses, the trend of the scores for occupational gender stereotypes was examined. We found that the trends in Study 1 were fully replicated with perceptions of stereotypes that reflect disproportionate gender distribution in the professional sphere in the real world (Cejka & Eagly, 1999; Koenig & Eagly, 2014); studies on a wide range of population confirmed this perception. The previous literature claimed that gender is easily perceived as a binary categorization of men and women, and once formed, gender stereotypes are relatively fixed

and persistent and reinforced by perceptions that emphasize differences instead of similarities between men and women (Ellemers, 2018). Interestingly, college students and other participants with a wide age range exhibited a neutral image of gender-balanced occupations. The result pointed to the usefulness of efforts to achieve gender equality from numbers such as the quota system. In other words, given that gender stereotypes were formed due to the perception of the unequal distribution of men and women, stereotypes can be eliminated if people perceive an equal ratio of men and women in the job market. Additionally, career support professionals can provide advice on improving the manner of dissemination of information on gender and occupation in the media, such as newspapers, radio, television, and magazines, as well as on the Internet.

In support of the extant research (Adachi, 2017; Matsui et al., 1989), a comparison of self-efficacy scores revealed that men possessed higher levels of self-efficacy in male-dominated fields; conversely, women exhibited higher levels of self-efficacy in female-dominated fields. As described by social cognitive career theory (Lent et al., 1994; Lent & Brown, 2019), scholars proposed that men and women develop self-efficacy in occupational fields dominated by one's gender through gender socialization and gendered learning experiences. Correspondingly, they encountered difficulty in developing self-efficacy in fields dominated by the opposite gender. Given that no gender differences in self-efficacy existed in gender-balanced fields, the study concluded that people possess low levels of self-efficacy for occupational domains with fewer active same-gender role models. However, no such gender effect existed if men and women were equally active.

In support of Hypothesis 1, the results of the hierarchical multiple regression analyses indicated that men were less interested in the social domain, which is dominated by women, whereas women were less interested in the

realistic domain, which is dominated by men. The results are in agreement with those of Einarsdóttir and Rounds (2020), who reported that men and women were more interested in the realistic and social domains, respectively. The findings are also in line with those of a meta-analysis that reported that men displayed preferences for object-oriented careers, whereas women exhibited interest in people-oriented careers (Su et al., 2009). However, as presented in Hypothesis 2, self-efficacy in social and realistic activities mediated gender differences in the social and realistic domains, respectively, which means that domain-specific self-efficacy acted as a mediating factor. This result is in accordance with social cognitive career theory, which posited that self-efficacy intervenes in the process by which a personal input, such as gender and race, influences interests (Lent et al., 1994; Lent & Brown, 2019), and with previous studies that reported self-efficacy as a major mediator of gender difference in interests (Chan, 2022; Tellhed et al., 2017). The result can be interpreted from the standpoint that the individual characteristics of gender do not directly influence the career choice process. Instead, they lead to different career choices through various gender-specific informational sources of self-efficacy, such as cultural socialization experiences (Lent & Brown, 2013).

In partial support of Hypothesis 3, the current study revealed that the self-efficacy of women in male-dominated field is positively associated with realistic interests, but the study observed no significant effect for the self-efficacy of men in female-dominated fields. This finding is consistent with those of previous studies, which emphasized the effect of the gender-stereotypical ability beliefs of women on interests instead of that of men (Tellhed et al., 2017). Tellhed et al. (2017) pointed out that women's low interest in STEM was strongly influenced by low levels of self-efficacy and that levels of self-efficacy for men were not an important mediator of gender differences in interest in the HEED sector. Chan (2022)

reported that female students with traditional gender role beliefs are less likely to be interested in STEM and less likely to pursue STEM-related careers, because they doubt their abilities in STEM and possess low levels of self-efficacy. Simply put, self-belief bound by socially constructed gender ideologies narrowed the range of occupational interests and choices, especially among women. Therefore, future research should examine the interaction between self-efficacy and attitudes toward these traditional and nontraditional gender roles and the influence of this interaction on the process of narrowing down one's interests, goal setting, and implementation.

Conclusion

This study aimed to examine the psychological mechanism that underlies occupational gender segregation. In an extension of a previous finding, that is, people develop masculine versus feminine occupational images based on the occupancy of men and women, the current study presented that people perceive gender-balanced fields with negligible differences in gender ratios as gender neutral, and that this perception is common across a wide range of age groups. These results implied that when people assimilate and interpret occupational information, they overly focus on the number of men and women and recognize masculinity and femininity. Educational interventions and career support should help people recognize their stereotypes and minimize the impact of such stereotypes on the career decision-making processes and encourage people to explore future careers without considering socially constructed gender boundaries.

In support of previous studies, the current results confirmed that task-specific self-efficacy mediates gender differences in interest in the realistic and social domains, where the gender gap is large. Additionally, the study recognized the mediating effect of the self-efficacy of women in male-dominated domains. Educators

and career support officers are expected to provide sources of self-efficacy to minimize the effects of gender barriers, such as opportunities to experience activities in the domain of the opposite gender and provide role models who are active in the domain of the opposite gender. In this manner, the gender gap in interests can be mitigated. For women, another effective strategy should include interventions with self-efficacy decreased by the traditional notion that male-dominated jobs are not gender-appropriate.

This study provided practical implications for explaining the phenomenon of the gender division of labor and resolving the problem by examining gender stereotypes and self-efficacy as key concepts. However, the study has its limitations. The first is the mediating effect of self-efficacy for the opposite gender-dominated fields. This impact was much smaller than predicted. The reason may be that self-efficacy for opposite gender-dominated field interacts not only with biological sex but also with gender ideology and gender role attitudes. By examining the interaction between self-efficacy and socio-culturally construed gender beliefs, researchers can formulate support that is more tailored to individual tendencies. Another area of improvement was the assessment of occupational gender stereotypes. The current study lacked a sufficient verification of the reliability and validity of the measurement method. Thus, further reliability and validity of the instrument is required, and the appropriateness of the rating method needs to be verified and improved through further research. Moreover, changes occur in occupational gender shares over time; therefore, improving the measurement of occupational stereotype is necessary by examining the manner in which occupational images change in conjunction with the volatility of the labor market. Despite these improvements, the current study provided useful insights and practical suggestions for understanding occupational gender segregation from the psychological perspective. The findings obtained for the Japanese sample need

to be extended to other countries in the Asia-Pacific region to verify the applicability of the current results to other cultures and social contexts.

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Appendix

Male-dominated, Female-dominated, and Gender-balanced occupations extracted from 2020 Basic Survey on Wage Structure (Ministry of Health, Labour and Welfare, 2021)

	Ratio		Major groups
	Male	Female	
Male-dominated fields			
Administrative and managerial worker	.91	.09	(a)
System consultant, System designer, Data processing project manager	.78	.22	(b)
Motor vehicle sales worker	.91	.09	(d)
Residential facilities, office buildings and other management personnel	.92	.08	(e)
Security staff	.92	.08	(f)
Agriculture, forestry and fishery workers	.82	.18	(g)
Chemical product manufacturing worker	.83	.17	(h)
Conductor	.90	.10	(i)
Electric construction worker	.99	.01	(j)
Land-based cargo handling and carrying worker	.98	.02	(k)
Female-dominated fields			
Nurse	.12	.88	(b)
Dental hygienist	.00	1.00	(b)
Nutritionist	.10	.90	(b)
Care manager	.26	.74	(b)
Kindergarten teacher, childcare teacher	.06	.94	(b)
Reception and guidance clerical worker	.19	.81	(c)
Secretary	.10	.90	(c)
Insurance sales worker	.25	.75	(d)
Cosmetic service and bath worker	.20	.80	(e)
Flight attendant	.00	1.00	(e)
Gender-balanced fields			
Elementary school teacher, junior high school teacher	.58	.42	(b)
Author, journalist, editor	.66	.34	(b)
Designer	.47	.53	(b)
General and human affairs worker	.35	.65	(c)
Accountancy clers	.34	.66	(c)
Retailer, retail manager, wholesaler, wholesale manager, shop assistant	.52	.48	(d)
Hairdresser, beautician	.44	.56	(e)
Service worker in places of entertainment	.59	.41	(e)
Food ,beverage and cigarette manufacturing worker	.56	.44	(h)
Building cleaning worker	.53	.47	(k)

Note: Major groups: (a) administrative and managerial workers, (b) professional and engineering workers, (c) clerical workers, (d) sales workers, (e) service workers, (f) security workers, (g) agriculture, forestry and fishery workers, (h) manufacturing process workers (i) transport and

machine operation workers, (j) construction and mining workers, (k) carrying, cleaning, packaging, and related workers