



Universidade de Brasília

Instituto de Psicologia

Programa de Pós-Graduação em Psicologia Social, do Trabalho e das Organizações
(PPG-PSTO)

Tese de Doutorado

Aprendizagem Informal no Trabalho: Em busca de um modelo global de predição

Flávia Lucena Barbosa

Orientador: Prof. Dr. Jairo Eduardo Borges-Andrade

Brasília – DF

Dezembro de 2024



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Tese de Doutorado apresentada ao Programa de Pós-Graduação em Psicologia Social, do Trabalho e das Organizações, como requisito parcial à obtenção do grau de Doutora em Psicologia Social, do Trabalho e das Organizações.

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Resumo Geral

A aprendizagem informal é uma ferramenta estratégica para lidar com mudanças no trabalho. A maioria dos estudos sobre antecedentes de Comportamentos de Aprendizagem Informal (CAIs) usou amostras pequenas e relativamente homogêneas. Assim, esta Tese investigou os antecedentes de CAIs – Interação (IT) e Autonomia no Trabalho (AT) e Prontidão para Aprender (PA) – em amostras diversificadas de países, ocupações e idades. Para isso, utilizamos os dados secundários do *Program for the International Assessment of Adult Competencies* (PIAAC). Esse modelo de predição ainda foi testado sob diferentes modelos teóricos para avaliar as interferências da participação em treinamento e da cultura nacional. No Estudo 1, testamos a estrutura e a confiabilidade dos instrumentos do PIAAC e investigamos o impacto de IT, AT e PA sobre CAIs. Obtivemos uma solução com quatro fatores e todos esses antecedentes estão positivamente relacionados aos CAIs, mas IT tem o maior poder preditivo. No Estudo 2, em amostra agregada de todos os países do PIAAC, encontramos que participantes de treinamentos emitiram CAIs médios mais altos com menor variância que não participantes. Essa participação moderou apenas a predição de CAIs por IT e AT, mais fortemente entre não participantes. Entretanto, essa moderação diferiu entre países. No Estudo 3, o impacto das dimensões culturais de países não teve relações diretas significativas com CAIs. Contudo, a predição do modelo do Estudo 1 foi moderada pelas dimensões Distância de Poder, Individualismo e Motivação para Realização e ao Sucesso. Nossos achados podem apoiar políticas globais de desenvolvimento de competências para o trabalho, em distintas faixas etárias de trabalhadores em uma variedade de ocupações.

Palavras-chave: comportamentos de aprendizagem informal, interação e autonomia no trabalho, prontidão para aprender, participação em treinamento, cultura nacional.

General Abstract

Informal learning is a strategic tool for coping with changes at work. Most studies on antecedents of Informal Learning Behaviors (ILBs) have used small and relatively homogeneous samples. Thus, this Thesis investigated the antecedents of CAIs – Workplace Interaction (WI) and Autonomy (WA), and Readiness to Learn (RtL) – in diverse samples of countries, occupations, and ages. For this, we used secondary data from the Program for the International Assessment of Adult Competencies (PIAAC). This prediction model was also tested under different theoretical frameworks to assess the interferences of participation in training and national culture. In Study 1, we tested the structure and reliability of the PIAAC instruments and investigated the impact of WI, WA, and RtL on ILBs. We obtained a four-factor solution and all these antecedents are positively related to ILBs, but WI has the greatest predictive power. In Study 2, in an aggregated sample from all PIAAC countries, we found that training participants reported higher mean ILBs with lower variance than non-participants. Participation in training moderated only the prediction of ILBs by WI and WA, more strongly among non-participants. However, this moderation differed across countries. In Study 3, the impact of country cultural dimensions had no significant direct relationships with ILBs. However, the prediction of the Study 1 model was moderated by the dimensions of Power Distance, Individualism, and Motivation towards Achievement and Success. Our findings may support global policies for developing skills for work across different age groups of workers in a variety of occupations.

Keywords: informal learning behaviors, workplace interaction and autonomy, readiness to learn, participation in training, national culture.

Introdução Geral

Constantes transformações tecnológicas, econômicas e sociais e a fluidez nas carreiras são características de um cenário globalizado do trabalho. Para garantir a competitividade nesse contexto complexo, profissionais e organizações recorrem à aprendizagem no trabalho como ferramenta estratégica. O termo ‘trabalho’ não está limitado a instituições como profissão e emprego. Ele é muito mais abrangente, englobando contextos nos quais ocorrem atividades intencionais que demandam esforço ou persistência, sejam como obrigação ou desafio (Borges-Andrade, 2015).

A compreensão do termo ‘aprendizagem no trabalho’ deve ter foco na elasticidade desse conceito, ou seja, entendendo a gradação entre ‘aprendizagem’ e ‘trabalho’ (Stern & Sommerland, 1999). Esses autores sugerem três abordagens para o conceito: a) O local de trabalho como local para aprender: supõe a separação espacial da aprendizagem do trabalho, onde as atividades de aprendizagem – tipicamente na forma de treinamento na empresa – ocorrerão fora do trabalho e fora do ambiente de trabalho imediato; b) O local de trabalho como ambiente de aprendizagem: a aprendizagem também é planejada e organizada, mas ocorre dentro do ambiente de trabalho e é em grande parte no trabalho; c) Aprender e trabalhar como inextricavelmente ligados: o local de trabalho é estruturado para maximizar os processos de aprendizagem, onde os funcionários aprendem como aprender e aprendem habilidades relacionadas ao seu próprio trabalho e aos de outros trabalhadores.

Embora essa não seja a única abordagem para a compreensão do conceito ‘aprendizagem no trabalho’, ela destaca que existe um continuum que vai da aprendizagem não-organizada – resultante do trabalho – até a aprendizagem em um ambiente educacional estruturado (Janssens et al., 2017). Apesar da maioria dos estudos e investimentos se concentrarem em aprendizagem formal, a modalidade informal pode ter mais relevância para o desempenho no ambiente de trabalho (Clardy, 2018; Tynjälä, 2008). Não existem muitas

divergências quanto à definição de aprendizagem formal. De maneira geral, é entendida como atividades de aprendizagem planejadas com o objetivo de auxiliar os indivíduos a adquirirem as competências (conhecimentos, habilidades e atitudes) necessárias para desempenhar bem o trabalho; essas atividades incluem quase todos os programas de treinamento e desenvolvimento oferecidos por organizações (Eraut, 2000; Marsick & Watkins, 1990, 2001). Dessa forma, esses programas ocorrem em um contexto destinado especificamente à aprendizagem, supondo sua promoção fora do ambiente de trabalho real.

As maiores divergências ocorrem em relação à definição de aprendizagem informal. Às vezes ela é definida em contraposição ao que não é formal e há pouco acordo sobre como o atributo ‘informal’ é definido, delimitado ou usado (Colley et al., 2002). A aprendizagem informal pressupõe que a aquisição de competências no ambiente de trabalho não ocorre apenas a partir de programas organizados, ocorrendo durante momentos críticos de necessidade inseridos no ambiente de trabalho real (Manuti et al, 2015).

A aprendizagem informal acontece quando as pessoas têm necessidade, motivação e oportunidade de aprendizagem; é muitas vezes intencional, mas não estruturada e contextualizada (Marsick, 2009). Contudo, ela também pode ser caracterizada como não intencional, implícita, oportunista e sem a presença de um professor, segundo Eraut (2004). Ele a divide em: Implícita (o aprendiz não está ciente de adquirir novas habilidades), Reativa (o indivíduo faz um esforço consciente para aprender, mas o contexto não permite muito tempo para pensar), e Deliberativa (a pessoa deve concluir um objetivo relacionado ao trabalho e isso provavelmente pode levar ao aprendizado). Essas definições exemplificam as divergências sobre a definição de aprendizagem informal, principalmente sobre se ela tem caráter intencional ou incidental.

Uma metanálise com o objetivo de identificar quais são os fatores antecedentes e consequências de Comportamentos de Aprendizagem Informal (CAIs) foi realizada por

Cerasoli et al. (2018). Os autores fizeram uma importante distinção entre os construtos ‘aprendizagem informal’ e CAIs. Enquanto aquela se refere a conhecimentos e habilidades adquiridas através de CAIs, estes podem ser definidos como atividades predominantemente autodirigidas, intencionais e localizadas no ambiente de trabalho ao serviço da aquisição de competências. A discordância concernente à distinção entre as modalidades formal e informal seria consequência da dificuldade para diferenciar a fonte das competências adquiridas (Billett, 2002; Cairns & Malloch, 2011). A separação feita na metanálise de Cerasoli et al. (2018) entre comportamentos (CAIs) e resultado (aprendizagem informal) permite uma investigação mais precisa sobre como as competências são adquiridas no ambiente de trabalho. Identificar que tipo de comportamento de aprendizagem – formal ou informal – é a fonte das competências adquiridas permite intervenções mais apropriadas de desenvolvimento de pessoal no ambiente de trabalho.

O termo CAIs foi adotado na metanálise de Cerasoli et al. (2018) e na revisão integrativa sobre antecedentes de aprendizagem informal de Jeong et al. (2018a). Mas não é incomum encontrar artigos que usam outros termos, mesmo depois desses estudos. Alguns exemplos desses termos são: atividades de aprendizagem no local de trabalho (Grosemans et al., 2015; Margaryan, 2019); aprendizagem profissional (Beverborg et al., 2015); prática deliberada (Keith et al., 2016); *informal field-based learning* (Wolfson et al., 2019); *lifelong learning behaviors* (Zhou & Tu, 2019); e esforço de aprendizagem informal (Baburaj & Kumar, 2022). Apesar das nomenclaturas diferentes, o foco é em condutas ou ações agenciadas pelos trabalhadores, com a intenção de aprender fora de ambientes estruturados de aprendizagem. Nesta Tese, adotamos as definições de CAIs e aprendizagem informal de Cerasoli et al. (2018).

Essa conceituação estabelece que a aprendizagem informal é derivada de CAIs e estes têm caráter intencional. Existe uma ampla gama de CAIs e estudos tendem a abordar apenas

alguns em suas investigações. CAIs como experimentação, reflexão, e aprender com os outros sem ou com interação foram analisados por Grosemans et al. (2015). CAIs definidos como aprender consigo mesmo, com outros e com fontes não-interpessoais foram utilizados por Noe et al. (2013). CAIs também podem ser busca por *feedback* e aprendizagem baseada em reflexão, vicariante e através de experimentação, tentativa e erro e novas experiências (Wolfson et al., 2018; Wolfson et al., 2019). Também foram investigados como diferentes tipos de troca de conhecimentos – troca de informações, ajuda e *feedback* (Colognesi et al., 2020), aprender com os outros, auto-experimentação e exploração externa (Choi & Jacobs, 2011; Khandakar & Pangil, 2019; Kwon & Cho, 2020), aprendizagem através da mídia, e interações com colegas, *stakeholders* e alunos e reflexão (Huang et al., 2020), experiência/ação, busca por *feedback*, reflexão e intenção de aprender (Tannenbaum et al., 2010), discussões e trabalho colaborativo (Eraut, 2010). Os CAIs que investigamos nesta Tese – advindos dos dados secundários do *Program for the International Assessment of Adult Competencies* (PIAAC) – podem ser considerados como congruentes com a taxonomia de Noe et al. (2013).

A metanálise de Cerasoli et al. (2018) foi o ponto de partida desta Tese. Esses autores organizaram o campo da aprendizagem informal, estabeleceram uma definição apropriada para a condução de estudos de investigação mais precisos, e nos anos seguintes àquela publicação foram frequentemente e crescentemente citados em estudos nesse campo. Além disso, apontaram lacunas de conhecimento científico que ainda existem. Muitas delas ocorrem devido a recursos financeiros e de tempo limitados, além da pouca variedade de amostras. O objetivo geral desta Tese é identificar um modelo preditivo de CAIs que tenha um caráter global; isto é, que possa ser testado não só para identificar se determinados antecedentes são preditores significativos de CAIs, mas se esse modelo pode ser usado para investigar diferentes relações que envolvam CAIs e seus antecedentes diante de outros

possíveis fatores interferentes e diferentes modelos teóricos. Para isso, selecionamos três lacunas apontadas por Cerasoli et al., (2018) para levar em conta em nossos objetivos específicos de pesquisa: a) testar um modelo de mensuração com evidências de validade e se Interação e Autonomia no Trabalho e Prontidão para Aprender ainda são antecedentes significativos de CAIs quando testados em uma amostra heterogênea em termos de idade, escolaridade, e profissões; b) investigar o impacto da participação em treinamento na relação entre CAIs e seus antecedentes; e c) estudar o impacto da cultura nacional na relação entre CAIs e seus antecedentes. Discutiremos brevemente esses três objetivos a seguir. Destacamos que essa é uma breve introdução aos objetivos da Tese e que eles foram mais profundamente expostos nos respectivos artigos. Encerraremos esta Introdução Geral descrevendo um pouco sobre a base de dados que escolhemos analisar e as principais justificativas para usá-la.

Antecedentes de Comportamentos de Aprendizagem Informal

Os fatores antecedentes de CAIs são (Cerasoli et al., 2018):

- a) Pessoais: predisposições individuais, tais como personalidade, propensão para engajar em comportamentos orientados para a aprendizagem, necessidade percebida para aprendizagem informal, orientação para aprendizagem como meta (intenção de se envolver em atividades desafiadoras, melhorar a si mesmo e uma tendência de usar o desempenho anterior como um padrão para avaliar o desempenho atual), motivação para aprender, autoeficácia generalizada e características demográficas (idade, gênero, escolaridade, entre outros);
- b) Situacionais: características do trabalho/tarefa (demandas, recursos, controle/autonomia), suporte de pessoas (supervisores, colegas, papéis-modelos, parceiros), suporte organizacional formal (recompensas, processos e sistemas) e suporte organizacional informal (clima de aprendizagem organizacional, discussões de oportunidades de aprendizagem associadas com designação de projetos, uso de *debriefs* para encorajar comportamentos de reflexão, líderes que relatam suas experiências para encorajar outros a refletirem sobre as suas próprias,

capital social, cultura, normas, suporte organizacional percebido) e oportunidades para aprender (extensão que a situação promove potencial para aprendizagem), *feedback*, carga de trabalho, tempo, tipo ou setor da organização.

Outra revisão de literatura apontou resultados semelhantes em relação aos antecedentes de CAIs (Jeong et al., 2018a). Os autores ressaltaram que os antecedentes podem ser divididos em três níveis:

- a) Individual: características sociodemográficas (idade, gênero, escolaridade, entre outros), características pessoais (capacidade cognitiva, autoeficácia, personalidade, motivação para aprender, percepção da aprendizagem, atitude ou crença epistêmica) e características do trabalho (cargo, antiguidade, função, departamento, nível de habilidade, posse, motivação de carreira, interesse na profissão, compromisso com o desenvolvimento profissional, valor do trabalho, satisfação no trabalho, trabalho desafiador, autonomia de tarefa, intensidade de trabalho, demanda/controlado do trabalho, utilidade do conhecimento em um trabalho);
- b) Grupal: liderança (suporte gerencial/supervisor, características gerenciais, responsabilidade gerencial e motivação), *feedback* (diálogo reflexivo, encorajamento positivo, comunicação aberta, apoio entre os membros do grupo), *networking* (comunicação com pessoas de fora, amálgama de redes internas e externas, fazer perguntas e observar outros colegas) e relacionamento interpessoal (comunicação interpessoal, compartilhamento aberto, confiança e respeito, interações sociais positivas);
- c) Organizacional: características organizacionais (tipo, tamanho, tipo industrial, relações de poder e hierarquia), intervenções organizacionais (reuniões, planos de desenvolvimento pessoal, mentoria/*coaching*, reconhecimento, falta de recompensa), cultura organizacional (missão e tradição, cultura de suporte à aprendizagem, resistência dos funcionários à mudança, grau de mudança e demandas, segurança psicológica) e recursos e ferramentas de trabalho (ferramentas de informação/comunicação, especialistas dentro ou fora da

organização, estrutura física e arquitetônica, falta de tempo e fundos, pressão de trabalho e alta expectativa, suporte do sistema de RH).

Estes antecedentes – da metanálise e da revisão de literatura – foram obtidos com base em diferentes estudos, que utilizaram distintos instrumentos e procedimentos, com ocupações variadas e em diferentes países. A literatura sobre o conceito de aprendizagem informal apresenta uma série de divergências e estas acabam refletindo nas medidas utilizadas nos instrumentos catalogados por Cerasoli et al. (2018) e Jeong et al. (2018a). Além disso, a falta de consenso sobre a definição de aprendizagem informal dos estudos pode levar a indicadores errôneos sobre a real relevância desse construto no contexto de trabalho (Clardy, 2018).

Não se sabe se os antecedentes previamente citados ainda seriam relevantes em uma única amostra mais heterogênea que incluísse diversos países, ocupações e gerações. Se esses antecedentes tivessem um caráter mais próximo do universal, políticas globais de promoção de CAIs poderiam ser propostas. Em um mundo do trabalho globalizado, é necessária a produção de achados científicos fundamentados que permitam a generalização sobre os antecedentes que promovem CAIs e apoiar políticas voltadas ao desenvolvimento de competências para o trabalho em diversas partes do planeta.

No Estudo 1, testamos a estrutura e a confiabilidade dos instrumentos por meio de análises fatoriais exploratória e confirmatória e cálculo da consistência interna das escalas. Investigamos ainda um modelo teórico de impacto de três variáveis antecedentes (Interação e Autonomia no Trabalho e Prontidão para Aprender) sobre CAIs – aplicável a amostras de diferentes países, idades e ocupações (Lucena Barbosa & Borges-Andrade, 2022). Interação e Autonomia no Trabalho constam na literatura a respeito de aprendizagem informal no trabalho (Cerasoli et al., 2018; Jeong et al. 2018a). Já o construto Prontidão para Aprender – como foi operacionalizado nesta Tese – foi uma criação dos desenvolvedores do PIAAC baseado no conceito de *deep learning* de Kirby et al. (2003). Dessa forma, Prontidão para

Aprender é uma combinação de itens relativos à motivação para aprender e reflexão intrínseca (Gorges et al., 2016; Smith et al., 2015). Esses foram considerados antecedentes relevantes de CAIs por Cerasoli et al. (2018), Ferreira et al. (2018), Jeong et al. (2018a), Lee et al. (2019), e Noe et al. (2017). Selecionamos esses indicadores por serem apontados como relevantes na metanálise de Cerasoli et al. (2018) e na revisão de Jeong et al. (2018a) e ainda constarem no modelo teórico de aprendizagem no trabalho de Illeris (2004). De acordo com esse modelo, o trabalhador tem um papel intencional e ativo em sua aprendizagem, dependendo de processos que envolvem traços disposicionais (cognitivos, afetivos e motivacionais) dessas pessoas e características contextuais (socioculturais e técnico-organizacionais) do trabalho. Em nossa Tese, os aspectos disposicionais e contextuais são operacionalizados por Prontidão para Aprender e Interação e Autonomia no Trabalho, respectivamente.

Comportamentos de Aprendizagem Formal e Informal

Outro aspecto sobre a aprendizagem na modalidade informal que ainda não é consensual é a sua relação com a modalidade formal e essa lacuna é provavelmente decorrente de diferentes definições que podem antagonizar essas modalidades ou considerá-las complementares. A formal é definida como a aquisição de competências por meio de atividades direcionadas e planejadas por um programa ou instrutor, baseadas em sala de aula e/ou curso, com objetivos de aprendizagem bem estabelecidos e normalmente procedem de forma linear, com início e fim previamente estabelecidos (Cerasoli et al., 2018). Essas atividades incluem quase todos os programas de treinamento e desenvolvimento oferecidos por organizações (Eraut, 2000; Marsick & Watkins, 1990, 2001). Desse modo, adotamos nesta Tese o termo ‘treinamento’ para representar as atividades de aprendizagem formal.

A aprendizagem informal no trabalho pode ser mais frequente que a formal (Clardy, 2018; Tynjälä, 2008). Entretanto, isso pode ser um desafio à ideia de que pode e deve haver uma distinção entre essas modalidades (Manuti et al., 2015). O modelo 3P – Prognóstico, Processo e Produto – de aprendizagem no trabalho de Tynjälä (2013) não distingue as modalidades formal e informal de aprendizagem, colocando-as na dimensão Processo. A autora cita que a distinção binária entre os tipos de aprendizagem nem sempre é adequada, uma vez que podem existir elementos de aprendizagem informal em atividades formais de aprendizagem e vice-versa (Billett, 2002; Cairns & Malloch, 2011; Colley et al., 2002). Com isso, estudos que buscaram investigar empiricamente a relação entre treinamento e CAIs apresentaram resultados conflitantes.

As oportunidades de aprendizagem formal podem ser usadas para estimular a participação de curto e longo prazo na aprendizagem informal – a força do sistema de gestão de recursos humanos intensificou essas relações (Bednall & Sanders, 2017). Resultados significativos entre a satisfação com o treinamento e três tipos de CAIs (busca de ajuda interpessoal, busca de ajuda de material escrito e aplicação prática) foram encontrados por Richter et al. (2020). Quando a satisfação é resultante de reflexão de participantes de treinamento, eles utilizam mais a aprendizagem informal (Kortsch et al., 2019). Além disso, existem evidências da complementaridade entre participação em treinamento e aprendizagem informal (Ferreira et al., 2018). Os resultados de Tannenbaum et al. (2024) indicaram que o treinamento facilita os processos de aprendizagem formal e que os CAIs compensam baixos níveis de treinamento.

Diferentemente desses achados, nenhuma relação entre essas modalidades foi encontrada no estudo de Werner (2021). A autora investigou se, após a participação em treinamento, os participantes apresentariam um aumento na utilização das estratégias de aprendizagem (busca de ajuda interpessoal, ajuda em material escrito, reprodução, aplicação

prática e reflexão) e se essas estratégias seriam preditoras positivas do impacto deste treinamento. Os resultados indicaram que não houve um aumento significativo na utilização de estratégias de aprendizagem e que somente a estratégia de busca de ajuda interpessoal apresentou um efeito significativo para o impacto do treinamento. A relação entre aprendizagem formal e informal também não emergiu dos resultados de Van der Heijden et al. (2009). Richter et al. (2020), cujos resultados significativos foram relatados no parágrafo anterior, não os encontraram quando testaram a relação entre utilidade do treinamento e CAIs. Uma ênfase exagerada na aprendizagem informal pode desencorajar o envolvimento em treinamento formal fundamental ou crítico, podendo até mesmo comprometer os resultados do treinamento, argumentaram Wolfson et al. (2018). Entretanto, não foram encontrados estudos que corroborem essas alegações.

A integração da aprendizagem formal e informal é necessária para promover competências desejáveis, tanto do ponto de vista individual quanto organizacional. Porém, é preciso prover mais evidências científicas sobre a relação entre CAIs e participações em atividades formais de aprendizagem (treinamento). Identificar como ocorre a dinâmica entre participação em treinamento e CAIs e como essa participação pode interferir na relação entre CAIs e seus antecedentes podem contribuir para a elaboração de políticas de Treinamento, Desenvolvimento e Educação (TD&E) e otimizar as decisões sobre investimento de recursos financeiros e de tempo na modalidade mais adequada de aprendizagem. A distinção conceitual feita na metanálise de Cerasoli et al. (2018), entre processo (comportamentos) e resultado (aprendizagem) pode permitir a obtenção de evidências empíricas sobre se a aprendizagem formal e a informal são construtos diferentes e investigar sua relação.

Uma possível razão dos estudos previamente citados sobre a relação entre participação em treinamento e CAIs terem apresentado resultados contraditórios pode ser atribuída às diferenças dos países onde esses estudos foram realizados. Assim, no Estudo 2

analisamos a relação entre participação em treinamento e CAIs, além do papel moderador da participação em treinamento no modelo obtido no Estudo 1 (Lucena Barbosa & Borges-Andrade, 2024a). Analisamos tanto a amostra agregada dos países – como no Estudo 1 – quanto as amostras separadas por país.

Comportamentos de Aprendizagem Informal e Cultura Nacional

Comportamentos no ambiente de trabalho podem ser influenciados por características de culturas nacionais (Taras et al., 2010). Tais culturas podem facilitar ou promover diferentes relações sociais, estilos de comunicação e liderança, padrões de respeito à hierarquia e autoridade e de respeito à pontualidade, normas para exercer autonomia, correr riscos e alcançar realização pessoal, por exemplo (Hofstede et al., 2010). Quando as pessoas precisam aprender informalmente – visando enfrentar desafios ou remover obstáculos em suas equipes ou postos de trabalho – devem ter em conta essas relações, estilos, padrões e normas. Desse modo, poderão estar sujeitas àquelas características culturais ou a particularidades de suas equipes ou de seus postos de trabalho (Millington, 2011).

Cada indivíduo pertence a diferentes grupos e o conceito de cultura abrange diferentes níveis. No Estudo 3, focamos na cultura nacional, pois as particularidades de equipes e de postos de trabalho já foram objeto de revisões e meta-análises relativamente recentes (Cerasoli et al., 2018; Jeong et al., 2018a; Manuti et al., 2015). Cultura nacional refere-se a um conjunto de formas comuns de pensar e agir específicas de um país e distintas de outros países. Os impactos da cultura nacional são investigados devido à força que as nações exercem para integrar linguagem, leis, educação, política e economia (Hofstede et al., 2010). Existem vários modelos sobre cultura e diferenças culturais entre países (Hofstede, 1988, 2010; Schwartz, 2006; House et al., 2004; Trompenaars, 1993; Inglehart, 2000).

Como um dos objetivos desta Tese é identificar se o modelo proposto sobre a relação de CAIs e seus antecedentes varia conforme a cultura nacional, não faremos uma exposição

exaustiva de todos os modelos de diferenças culturais. Em vez disso, será descrito brevemente o modelo taxonômico escolhido para a investigação do impacto da cultura nacional na relação entre antecedentes e CAIs – o modelo de dimensões culturais de Hofstede (1980; Hofstede et al., 2010). A escolha por este modelo ocorreu por este ser o mais utilizado como ferramenta teórica para compreender o impacto da cultura no treinamento, aprendizagem, desenvolvimento e gestão (Kortsch et al., 2023). Além disso, realizamos uma revisão integrativa de artigos que investigaram a relação entre cultura nacional e CAIs – que será descrita posteriormente – e só encontramos artigos que utilizaram esse modelo de diferenças culturais.

Ao trabalhar na multinacional IBM, Hofstede percebeu que apesar de a empresa ter a própria cultura corporativa, existiam grandes diferenças culturais entre os funcionários de diferentes países e regiões onde aquela organização atuava. Então, conduziu pesquisas sobre essas diferenças em suas subsidiárias. Inicialmente, o modelo contava com quatro dimensões (Hofstede, 1980): a) Distância de Poder (grau em que a autoridade é aceita e seguida); b) Coletivismo / Individualismo (até que ponto as pessoas cuidam umas das outras como uma equipe ou cuidam apenas de si mesmas); c) Feminilidade (preferência por cooperação, modéstia, cuidado com os fracos e qualidade de vida) / Masculinidade (preferência na sociedade por realizações, heroísmo, assertividade e recompensas materiais pelo sucesso); d) Aversão à Incerteza (até que ponto as nações evitam o desconhecido). Ele identificou uma quinta dimensão, Orientação de Longo / Curto Prazo (como as sociedades priorizam as tradições ou buscam o moderno em suas relações com o presente e o futuro), ao usar o *Chinese Values Survey* (Hofstede & Bond, 1988). Hofstede também identificou a sexta dimensão Indulgência / Restrição (comparação entre a disposição de um país de esperar por benefícios de longo prazo, adiando a gratificação instantânea, ou preferências por não ter

restrições em aproveitar a vida no presente). Esta surgiu de sua colaboração com Minkov usando o *World Values Survey* (Hofstede et al., 2010).

Um sítio da *Internet* destinado a uma consultoria estratégica e analítica cultural com alcance global utiliza o modelo de Hofstede e apresenta os escores de diferentes países para as dimensões Distância de Poder, Individualismo, Motivação para Realização e Sucesso (anteriormente Masculinidade / Feminilidade), Aversão à Incerteza, Orientação de Longo Prazo e Indulgência (The Culture Factor Group, 2023). Conforme a classificação Motivação para Realização e Sucesso, uma sociedade pode ser: a) Decisiva: movida por competição, realização e sucesso; ou b) Orientada para o consenso: o sucesso é definido que qualidade de vida e o cuidado com os outros (The Culture Factor Group, 2023).

A maioria dos estudos sobre aprendizagem informal está localizada em contextos organizacionais e de trabalho e educacionais, mas outros contextos sociais – como família, comunidade ou cultura nacional – também podem ser o *locus* dessa aprendizagem (Jeong et al., 2018a). O impacto da cultura nacional na aprendizagem informal ainda era desconhecido e mais pesquisas seriam necessárias, conforme Marsick (2009). Os pesquisadores deveriam investigar os potenciais efeitos moderadores da cultura nacional na associação entre avaliação de desempenho e aprendizagem informal, recomendaram Bednall et al. (2014). Sugeriram – com base no modelo de Hofstede – que as percepções dos funcionários sobre a avaliação de desempenho podem ser diferentes de acordo com características da sua cultura nacional, tais como alta ou baixa distância de poder ou individualismo ou coletivismo.

Uma revisão a respeito do impacto da cultura nacional na aprendizagem informal foi realizada por Kim e McLean (2014). Esses autores adotaram o modelo taxonômico de dimensões culturais de Hofstede (1988; Hofstede et al., 2010). Entretanto, optaram por selecionar artigos que envolviam antecedentes de aprendizagem informal associados a essas dimensões, tais como autoconfiança, comprometimento, busca por *feedback*, relacionamento

colaborativo, recompensas, tarefas desafiadoras e mudanças. De acordo, com a revisão de Kim e McLean (2014), as possíveis influências das cinco dimensões culturais de Hofstede sobre antecedentes relevantes da aprendizagem informal seriam:

- a) Distância de poder: atitudes referentes ao *feedback*, envolvimento no compartilhamento de conhecimento, autodirecionamento e preferência pela fonte de aprendizagem e atitudes referentes ao *feedback* poderiam ser estar relacionadas à percepção de distância de diferentes pelo grau de sensibilidade no relacionamento com as pessoas que têm poder – pessoas de países com alta Distância de poder tendem a preferir aprendizagem formal e em baixa Distância de poder preferem aprendizagem informal;
- b) Coletivismo/Individualismo: pessoas de uma cultura coletivista prefeririam atividades de aprendizagem em grupo, em comparação a pessoas que possuem atividades focadas em valores e objetivos de cultura individualista; compartilhar informações – um tipo de CAI – ocorre para alcançar relacionamentos harmoniosos entre os trabalhadores em culturas coletivistas e para o benefício próprio em culturas individualistas;
- c) Feminilidade/Masculinidade: nas culturas femininas, os indivíduos se preocupariam com a aprovação social dentro da equipe ou grupo de aprendizagem, enquanto indivíduos nas culturas masculinas geralmente seriam orientados para objetivos e resultados da aprendizagem (motivados por realização ou sucesso);
- d) Aversão à Incerteza: em culturas avessas à incerteza, diretrizes mais específicas e claras podem ser necessárias para as atividades de aprendizagem, enquanto mais autonomia seria aceitável (ou demandada) em culturas menos avessas;
- e) Orientação de Longo / Curto Prazo: em culturas de orientação de longo prazo, as motivações e objetivos para a aprendizagem seriam geralmente para o sucesso ou mudança futura, enquanto em culturas voltadas ao curto prazo essas motivações seriam direcionadas

para problemas presentes ou desempenho iminente de trabalho – em vez de autodesenvolvimento.

Conforme descrito anteriormente, realizamos uma revisão integrativa de literatura sobre estudos empíricos – quantitativos e qualitativos – que investigaram a relação entre CAIs no trabalho e diferenças culturais de países – de acordo com as dimensões do modelo taxonômico de Hofstede et al. (2010). Seguimos a recomendação *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* ([PRISMA], Moher et al., 2009) para melhorar o relato e diminuir possíveis vieses de publicação. Para isso, identificamos a literatura relevante através do sistema de biblioteca eletrônica da Capes (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) – que dá acesso às maiores editoras do mercado, como Emerald, Springer, Elsevier e Hogrefe – e do Google Scholar. Nos artigos identificados nessas bases de dados, selecionamos citações e respectivas referências de outros artigos que também cumpriram os critérios. Filtramos a busca para que ela incluísse artigos com avaliação por pares e integralmente publicados em inglês, português e/ou espanhol. Porém, todos eles tinham, pelo menos, título e resumo em inglês. O ano inicial da data de publicação para a seleção desses artigos foi aquele em que o modelo taxonômico foi proposto (Hofstede, 1980). O levantamento foi finalizado em 14 de fevereiro de 2024.

Foram utilizados os seguintes elementos de busca (somente em inglês): *informal learning*, *culture* ou Hofstede e os termos de cada elemento foram combinados pela função “E”. Para ampliar a cobertura da busca, utilizamos sinônimos ou termos relacionados àqueles elementos. Dessa maneira, a sequência de termos (somente em inglês) foi digitada nas bases de dados: “*informal learning*” ou “*informal learning behaviors*” ou “*intercultural learning*” ou “*workplace learning*” ou “*work based learning*” ou “*experiential learning*” E “*national culture*” ou “Hofstede” ou “*Power Distance*” ou “*Individualism*” ou “*Collectivism*” ou “*Motivation towards Achievement and Success*” ou “*Masculinity*” ou “*Femininity*” ou

“*Uncertainty Avoidance*” ou “*Long Term Orientation*” ou “*Indulgence*”. Artigos duplicados, sem relatos de pesquisa empírica, que não avaliaram CAIs diretamente ou que não utilizaram o modelo de Hofstede et al. (2010) foram excluídos. Assim, foram utilizados elementos de busca que possibilitaram identificar artigos publicados em três idiomas, desde que tivessem pelo menos resumo ou título em inglês. Apesar de termos escolhido o modelo de Hofstede, nossas buscas ainda permitiam que estudos que aplicaram outros modelos pudessem aparecer. Entretanto, não encontramos nenhum relato de estudo.

Nossos resultados indicaram apenas oito artigos. Estes foram os únicos que efetivamente cumpriam o critério de seleção de estudos empíricos – qualitativos ou quantitativos – que buscaram verificar o impacto das dimensões do modelo de Hofstede em CAIs ou que apresentaram evidências relativas à adição de aspectos afinados com esse modelo e originalmente não previstos. Todos os artigos foram publicados após 2018 – mesmo ano dos artigos de Cerasoli et al. (2018) e Jeong et al. (2018a). Essa pequena quantidade pode sugerir um modesto crescimento do interesse em investigar as lacunas existentes sobre esse relacionamento. Não foram encontrados estudos que usassem a nova terminologia para a dimensão Masculinidade / Feminilidade: Motivação para Realização e Sucesso.

Os métodos foram predominantemente quantitativos – cinco artigos (Kim, 2020; Richter et al., 2020; Wang et al., 2024; Welk et al., 2022; Zotzmann et al., 2019). As dimensões culturais mais investigadas foram Distância de Poder e Coletivismo / Individualismo (cinco artigos). A maioria dos artigos – seis – apenas analisou uma das dimensões do modelo de Hofstede (Jeong et al., 2018b; Kim, 2020; Park et al., 2023; Richter et al., 2020; Wang et al., 2024; Welk et al., 2022). Cinco artigos relataram coleta e análise de dados em somente um país. Todos esses, com a exceção do artigo de Kim (2020) – que aplicou uma escala para avaliar a orientação individualista e coletivista dos respondentes – apenas partiram do pressuposto que as amostras analisadas pertenciam a culturas com

determinados níveis das dimensões culturais (Jeong et al., 2018b; Obara et al., 2021; Park et al., 2023; Wang et al., 2024). Dois artigos (Richter et al., 2020; Welk et al., 2022) utilizaram os escores de Hofstede et al. (2010) para analisar a relação entre dimensões da cultura nacional e CAIs. Zotzmann et al. (2019) optou por aplicar uma escala para avaliar os valores culturais de Hofstede no nível individual. Todos os artigos incluíram em sua amostra pelo menos um país asiático, sendo a China o país com maior presença. Nenhum deles incluiu países da América Latina e da África.

As relações entre Distância de Poder e os CAI ‘tentativa e erro’, ‘aprendizagem autodirigida’ e ‘fazer perguntas a outras pessoas’ foram discrepantes, nos achados de Jeong et al. (2018b). Esta dimensão, quando presente em escores elevados, poderia estimular aqueles comportamentos, se houvesse o desejo de desenvolvimento profissional e crescimento na carreira; mas poderia inibi-los, se faltasse independência e autonomia na tomada de decisões. Isso é, a elevada Distância de Poder impactaria CAIs, quando houvesse interação com outras variáveis: uma pessoal (disposição para desenvolver e crescer) – que encorajaria tais comportamentos – e outra de desenho do trabalho (subordinação e submissão) – que os desencorajaria.

Chineses (alta Distância de Poder) apresentaram as pontuações mais baixas para os CAIs ‘aprender com os outros’, ‘aprender consigo mesmo’ e ‘aprender com fontes não interpessoais’, depois de Britânicos (baixa Distância ao Poder), em uma empresa alemã com sede em vários países (Welk et al., 2022). Os autores inferiram uma combinação com outras dimensões culturais do Reino Unido (elevada Indulgência e elevado Individualismo). Além disso, a disponibilidade de *feedback* mediou o efeito da Distância de Poder no CAI ‘aprender com os outros’ dentro de um contexto social – empresa – diferente da cultura do país da amostra. A cultura dessa empresa (baixa Distância de Poder) pode ter anulado as preferências culturais nacionais, segundo Welk et al. (2022). Esses resultados aconselham a não descartar

o papel que as culturas de organizações multinacionais podem exercer em trabalhadores de um país estrangeiro, argumentaram esses autores. Além disso – juntamente com os encontrados por Jeong et al. (2018b) – esses achados destacam a importância de não se considerar apenas uma dimensão quando o impacto da cultura nacional é avaliado.

As relações entre cinco dimensões culturais e o CAI ‘orientação de erro’ (atitude e comportamento de aprender com os erros) foram investigadas por Zotzmann et al. (2019). Segundo os autores, a Distância de Poder foi significativamente e negativamente correlacionada com o CAI ‘orientação de erro’. Em outro estudo qualitativo, entrevistados japoneses – de uma sociedade com alta Distância de Poder – adotaram a mentoria paternalista, indicando que a aprendizagem era guiada formalmente de acordo com as orientações do mentor (Obara et al., 2021).

Análise de perfil latente foi utilizada em uma amostra de professores chineses investigados por Wang et al. (2024). Essa análise identificou diferentes perfis de alto, médio e baixo uso de CAIs (‘aprendizagem através da mídia, interações com colegas, *stakeholders* e alunos’ e ‘aprendizagem através da reflexão’). Ela ainda revelou a emergência de um novo perfil – distinto desses CAIs e com diferentes níveis de uso: Aprendizagem informal no local de trabalho orientada para a interação entre colegas. Esses autores hipotetizaram que essa emergência foi decorrente da amostra ser de uma cultura nacional coletivista. Em uma amostra coreana, ambas as orientações – individualista e coletivista – tiveram um impacto positivo no CAI ‘intenção de compartilhar conhecimento’ (Kim, 2020). Entretanto, o escore desse CAI foi mais elevado na orientação coletivista. Existe uma maior propensão entre coletivistas para partilhar o conhecimento para alcançar objetivos em comum, argumenta esse autor. Um estudo qualitativo, com 20 docentes de 15 universidades e faculdades na China, apontou que se envolviam em interações mais cooperativas do que competitivas – quando utilizavam os CAIs ‘aprendizagem com os outros’, ‘reflexão crítica’ e ‘exploração do ambiente’ para

resolver problemas de trabalho (Park et al., 2023). Nessa cultura coletivista, existiriam maiores incentivos para interações no local de trabalho e comprometimento com a aprendizagem dos colegas e isso poderia promover a ocorrência de CAIs, alegaram esses autores. O coletivismo foi significativa e positivamente correlacionado com o CAI ‘orientação de erro’ (Zotzmann et al., 2019).

A dimensão Masculinidade foi negativa e significativamente correlacionada com o CAI ‘orientação de erro’ (Zotzmann et al., 2019). De acordo com os resultados de Obara et al. (2021), os entrevistados de uma amostra japonesa – uma cultura com alta Masculinidade – indicaram que dependem de modelos de papéis sobre seus mentores para serem bem-sucedidos em um mundo acadêmico competitivo. Isso pode indicar uma tendência à aprendizagem formal. A Orientação de Longo Prazo foi significativa e positivamente correlacionada com o CAI ‘orientação de erro’ (Zotzmann et al., 2019). A Aversão à Incerteza não exerce efeitos diretos sobre CAIs, indicou o estudo de Richter et al. (2020). Entretanto, os achados desses autores apontaram que essa dimensão cultural exerce um efeito indireto sobre o CAI ‘buscar ajuda em material escrito’ via satisfação com treinamento; isto é, em países com elevada Aversão à Incerteza, os respondentes tinham a satisfação com treinamento mais elevada. Quando, posteriormente, esses respondentes recorreram a CAIs, eles buscavam fontes mais objetivas de conhecimento (material escrito) – em vez de fontes subjetivas (outras pessoas). Os resultados de Zotzmann et al. (2019) não encontraram relações significativas do CAI ‘orientação de erro’ com Aversão à Incerteza. Entretanto, uma elevada Aversão à Incerteza esteve associada à percepção de mais segurança com a liderança de um mentor (Obara et al., 2021).

Em uma amostra japonesa – cultura com baixa Indulgência e maior Restrição – os respondentes indicaram colocar o trabalho antes do lazer (Obara et al., 2021). Os trabalhadores têm um maior comprometimento com o trabalho e buscam constantemente

maneiras de melhorar seu desempenho, de acordo com os resultados de Obara et al. (2021). Uma dessas maneiras seria a emissão de CAIs no trabalho, o que poderia permitir uma maior adaptabilidade às necessidades do trabalho.

Além de serem escassos, estudos sobre possíveis diferenças entre países a respeito de CAIs não levam em consideração um modelo que inclua antecedentes relevantes para a ocorrência dessas atividades. Em um mundo globalizado, onde organizações multinacionais precisam lidar com funcionários de diferentes países, sejam eles funcionários diretos ou autônomos ligados às empresas (por exemplo, motoristas de aplicativos ou entregadores), é necessário encontrar evidências de possíveis variações no processo necessário para a aprendizagem informal. Nossa revisão indicou que poucos estudos que investigaram a relação entre cultura nacional e aprendizagem informal usaram as pontuações de Hofstede (Richter et al., 2020; Welk et al., 2022). Nenhum desses aplicou a técnica de análise apropriada para dados aninhados (indivíduos em diferentes países) para estudar essa relação. No Estudo 3, aplicamos a Modelagem Linear Hierárquica para investigar o impacto das seis dimensões culturais nacionais de Hofstede em CAIs e como elas moderam a previsão desses comportamentos pela Interação e Autonomia no Trabalho e Prontidão para Aprender (Lucena Barbosa & Borges-Andrade, 2024b).

Dados Secundários do PIAAC

Uma grande diversidade amostral era necessária, principalmente para investigar diferenças culturais entre países. Utilizamos dados secundários existentes que reúnem todas as variáveis que a Tese visa investigar. Esses dados são do primeiro ciclo do Programa de Avaliação Internacional de Competências de Adultos (*Programme for the International Assessment of Adult Competencies* – PIAAC) da Organização para a Cooperação e Desenvolvimento Econômico – OCDE (*Organisation for Economic Co-operation and Development* | OECD, n.d.a). O PIAAC foi desenvolvido e é utilizado para disponibilizar

informações que facilitem o enfrentamento do cenário de grandes transformações econômicas e tecnológicas, que exigem uma força de trabalho capacitada para enfrentar essas mudanças. Objetiva medir competências cognitivas de adultos – como proficiência em leitura, matemática e solução de problemas. Seus dados são abertos ao público e já contribuíram para a realização de estudos nos campos da aprendizagem e comportamento organizacional (Olsen & Tikkanen, 2018).

Uma inovação do PIAAC foi a introdução do *Background Questionnaire* (OECD, n.d.b). Além de informações gerais e características demográficas básicas dos entrevistados, esse questionário cobre uma gama de temas relacionados à aprendizagem, habilidades e trabalho (realização educacional, incidência de treinamento e aprendizagem informal). Também obtém dados sobre o *status* da força de trabalho, o histórico de trabalho e emprego, resultados sociais, utilização de competências em leitura, matemática e computação no trabalho e na vida cotidiana. Há ainda informações sobre a relação entre as qualificações dos respondentes e suas exigências de trabalho e sobre a autonomia que têm em aspectos-chave do seu trabalho (OECD, 2013).

Há muito tempo, pesquisadores têm sido encorajados ao uso de dados secundários como estratégia de pesquisa para contornar a escassez de recursos e outros fatores associados com o custo e o prazo disponível para esta etapa dos projetos (Kiecolt & Nathan, 1985). Além disso, nos últimos anos várias instituições – como a OCDE – têm disponibilizado esses dados de maneira gratuita, ampliando as possibilidades para os pesquisadores.

O uso de dados secundários em pesquisa é prática comum em diversas disciplinas, como a Economia e a Sociologia (Borges-Andrade & Abbad, 1996). Porém, os estudos em Psicologia Organizacional no Brasil ainda fazem pouco uso desses recursos, talvez por não contar com uma maior disponibilidade de tais informações (Gondim et al., 2010). Utilizar

dados secundários provenientes do PIAAC permite validar um modelo teórico não específico para o Brasil e comparabilidade entre amostras.

O PIAAC apresenta uma riqueza de conjuntos de dados existentes e que podem ser utilizados, tanto para formular quanto para responder importantes questões de pesquisa. Os dados do PIAAC contribuíram para vários estudos nos campos da aprendizagem e comportamento organizacional. Por exemplo, as condições relacionadas à aprendizagem informal no local de trabalho e às oportunidades de aprendizagem informal nas organizações da Espanha foram descritas por Pineda-Herrero et al. (2017). A relação entre o emprego temporário e a intensidade da aprendizagem informal no trabalho, em 20 países desenvolvidos, foi investigada na primeira rodada do primeiro ciclo do PIAAC (Ferreira et al., 2018). Entretanto, as pesquisas analisaram dados de alguns países, não de todos disponibilizados pela OCDE. Além disso, esses estudos não explicaram as propriedades psicométricas relativas à seleção das variáveis escolhidas e como sua escolha era justificada.

Selecionamos os dados de 122.897 respondentes que trabalhavam – como empregados ou autônomos – durante a coleta de dados do PIAAC em 34 países. Para cada um dos estudos foram selecionadas amostras para evitar desigualdade entre grupos – p. ex. participantes ou não de treinamento. O principal instrumento foi o *Background Questionnaire*, cujos itens orientaram a extração de dados para as análises. Nas seções referentes a cada estudo especificaremos os itens utilizados. Os questionários para coleta de dados estavam escritos nos idiomas oficiais desses países. Foram administrados por um entrevistador, que preenchia em um computador as informações obtidas com os respondentes. Os arquivos com essas informações são disponibilizados no sítio da *Internet* referente ao PIAAC (OECD, n.d.a). Baixamos e agrupamos esses arquivos em uma única base de dados, visando realizar as análises dos quatro estudos.

Não há informações relativas ao Brasil no PIAAC. Em 2014, houve um seminário intitulado ‘PISA e PIAAC: Melhores Competências, Melhores Empregos’, no Instituto Nacional de Estudos e Pesquisas Educacionais (INEP), em Brasília (Almeida, 2014). Apesar de ter sido noticiado que o Brasil estudava medir as competências dos adultos com o PIAAC (Tokarnia, 2014), ainda não há previsão para a adoção do programa. A ausência de dados pode gerar questionamentos de outros pesquisadores sobre a pertinência dos nossos resultados para o contexto brasileiro. Acreditamos que isso não deveria ser encarado como um ponto negativo, haja visto que utilizamos artigos empíricos de outros países para embasar pesquisas brasileiras. Não nos isolamos na crença de que apenas dados brasileiros têm relevância. Muitos de nós participamos de pesquisas internacionais. Além disso, o PIAAC também apresenta dados de países da América Latina, mais próximos da realidade brasileira, e abre possibilidade de inclusão de mais países no futuro. Caso o Brasil seja incluído, os resultados das aplicações anteriores podem fornecer uma boa base de comparação e permitir pensar na adoção de políticas que foram aplicadas por outros países baseadas nos resultados do PIAAC. Outra justificativa para o uso dos dados do PIAAC é a diversidade amostral que, a princípio, permite uma maior generalização dos resultados. A pouca reprodutibilidade de pesquisas em Ciências Humanas tem sido alvo de várias críticas (Sarafoglou et al., 2019). Utilizar dados de participantes de diferentes países, idades, escolaridades e ocupações aumenta não só as chances de generalização de resultados, mas também a realização de análises que exigem um número elevado de grupos para sua realização – caso do nosso Estudo 3.

A seguir serão apresentados os três estudos. Devido às regras de direitos autorais dos periódicos nos quais esses foram publicados, todos eles estão em inglês e nas formatações exigidas por cada editora. As tabelas e figuras de cada artigo se encontram após suas respectivas referências bibliográficas.

Informal Learning Behaviors, Interaction and Workplace Autonomy, and Readiness to Learn

Abstract

Purposes – To find a measurement model with better evidence of validity, with data extracted from the Program for the International Assessment of Adult Competencies (PIAAC). To test a parsimonious model in which dispositional and workplace context characteristics are predictors of informal learning behaviors (ILBs).

Design/methodology/approach – We performed exploratory and confirmatory factor analyses to improve the fit of the PIAAC data measurement model. Multiple linear regression was used to examine the prediction of ILBs by one dispositional variable (Readiness to Learn) and two workplace context variables (Autonomy and Interaction in the Workplace).

Findings – A measurement model emerged with 18 items divided into four factors. The three antecedent variables predicted ILBs. Interaction in the workplace resulted in higher scores, and workplace autonomy resulted in lower scores.

Research limitations/implications – The small number of items for ILBs prevented a more detailed exploration of predictors of different types of these behaviors. ILBs can be stimulated by policies that promote readiness to learn and that encourage the design of environments that require worker interactions and autonomy.

Originality/value – Few studies on ILBs in the workplace have investigated the prediction of dispositional and contextual antecedents based on a theoretical model. The findings herein were obtained using a diverse sample of countries, occupations, and generations, allowing better generalization. The importance of interpersonal relationships in the workplace for predicting ILBs was emphasized.

Keywords Informal learning behaviors, Readiness to Learn, Interaction and Workplace Autonomy, Technical-organizational and Sociocultural characteristics

Paper type Research paper

Introduction

Training is the focus of most investments and research aimed at acquiring competencies in organizations. However, competencies may be acquired through Informal Learning Behaviors (ILBs). Informal learning may be an alternative to overcome the limitations of traditional training technology - diagnosis of needs, instructional design, and evaluation of results. It may reduce costs and improve employee performance (Cho and Kim, 2016; Tynjälä, 2008; Wolfson *et al.*, 2018). The antecedents of the transfer of training received much research attention in the past and there is a current focus on creating a rich environment for workplace learning (Marsick *et al.*, 2011). Research participants learned much more from their work than through formally organized learning events (Eraut, 2011). Engagement in ILBs had a strong effect size on performance - better than for formal training - in a meta-analysis by Cerasoli *et al.* (2018). But these benefits may go beyond performance.

Positive effects of informal learning were observed on four skills necessary for employability (anticipation and optimization, corporate sense, personal flexibility and balance), according to Froehlich *et al.* (2020). They also found that those who have mastery-approach goal orientation (who strive to become better to improve themselves) tend to be more involved in informal learning activities, increasing their employability. Population aging is a challenge for the labor market. High life expectancy and low birth rates mean that the workforce is increasingly made up of older workers. Thus, it becomes necessary to train these workers to acquire skills to keep up with the innovations and productivity demands of a constantly changing labor market (Froehlich *et al.*, 2015; Van der Heijde & Van der Heijden, 2006). Informal learning may contribute to the acquisition of skills by older workers.

Informal learning will take place wherever people have a need, motivation, and learning opportunity; it is often intentional but not structured and contextualized (Marsick

and Watkins, 2001). It can be characterized as implicit, unintentional, opportunistic and unstructured and without the presence of a teacher (Eraut, 2004). He divides informal learning into: implicit (the learner is not aware of acquiring new skills), reactive (the learner makes a conscious effort to learn but the context does not allow much time to think) and deliberative (the learner must complete a work-related goal and this can probably lead to learning).

Workplace learning may occur based on four dimensions: action (individual behavior), subjective (capacity or competence), social (interaction with other individuals), and structural (work context) (Ellström, 2011). Its promotion should be designed under two organizational logics, according to him: production and development. The former supposes efficiency, effectiveness and reliability and would reduce performance variation. The latter supposes innovativeness and would promote or explore variation and diversity in thought and action. They may be contradictory, in the short and medium terms, but they would be needed for long term organizational sustainability in a moving international scene.

Constant technological, economic, and social transformations and career fluidity are characteristics of a globalized work scenario. This scenario lacks the production of scientific findings based on diverse samples of countries, occupations, and ages. This may allow a better generalization of the factors that promote ILBs and support global policies aimed at the development of job skills in different occupations and ages. There is a need for more studies with an international focus that would contribute to grasp informal learning in that scenario (Noe *et al.*, 2014). The objectives of the present study were the following: 1) to test a measurement model with evidence of validity in a sample with those diversification characteristics and 2) to investigate the prediction of ILBs by the variables Readiness to Learn, Interaction and Autonomy in the Workplace, under such sample diversification circumstances. That criterion variable (ILBs) and these three antecedent variables are

respectively related to the action and to the subjective, social and structural dimensions proposed by Ellström (2011).

Informal Learning Behaviors (ILBs)

The antecedent factors of ILBs were identified in that meta-analysis by Cerasoli *et al.* (2018). In addition, these authors made an important distinction between informal learning and ILB constructs. Informal learning refers to knowledge and skills acquired through ILBs. These can be defined as:

... non-curricular behaviors and activities pursued in service of knowledge and skill acquisition that take place outside formally-designated learning contexts. Such activities are predominantly self-directed, intentional, and field based. Informal learning behaviors are not syllabus based, discrete, or linear. (p. 204).

This definition distinguishes outcome (learning) and process (behavior). Its other virtue is that it does include antecedents as part of the construct. Therefore, it may be used with models such as that proposed by Ellström (2011).

The possible antecedents of ILBs are: 1) Personal: individual predispositions, such as personality, motivation to learn, generalized self-efficacy, propensity to engage in ILBs, perceived need for ILBs, learning goal orientation (intention to engage in challenging activities, improve oneself and a tendency to use previous performance as a standard to evaluate current performance), and demographic characteristics (age, gender, education, and others); and 2) Situational: time and opportunities to learn, feedback, workload, type or sector of the organization, work/task characteristics (demands, resources, control/autonomy), people support (supervisors, colleagues, role models, partners), and formal and informal organizational support (organizational learning environment, discussions about learning opportunities associated with project designation, use of debriefs to encourage reflection behaviors, leaders who report their experiences to encourage others to reflect on their own

experiences, social capital, culture, norms, perceived organizational support). Situational antecedents are significantly related to social interaction factors.

These antecedents may be categorized in terms of those four dimensions priorly proposed by Ellström (2011). They were obtained as part of a meta-analysis of several studies that used different instruments, procedures, and results with different occupations and in different countries (Cerasoli et al., 2018). However, there is a database collected in several countries with diverse occupational and generational samples. It is the public database of the Program for the International Assessment of Adult Competencies (PIAAC). It gathers many of those ILBs antecedents but uses similar instruments and data collection procedures.

PIAAC, ILBs and their Antecedents

The Organization for Economic Cooperation and Development (OECD) developed the PIAAC. It measures adult cognitive skills, such as proficiency in reading, mathematics and problem solving in highly technological environments. In addition, it addresses basic demographic characteristics of the respondents related to the status of the workforce, the work and employment history, the relationship between the qualifications of respondents and their work requirements, the characteristics of the work and education (educational level, incidence of formal training and informal learning), among others.

The PIAAC data contributed to several studies in the fields of learning and organizational behavior (Olsen and Tikkanen, 2018). For example, the conditions related to informal learning in the workplace and opportunities for informal learning in Spanish organizations were described by Pineda-Herrero *et al.* (2017). The relationship between temporary employment and the intensity of informal learning in the workplace in 20 developed countries was investigated in the first round of the first cycle of the PIAAC (Ferreira *et al.*, 2018). However, the studies analyzed data from some countries instead of data from all countries that were made available by OECD. In addition, these studies did not

explain the psychometric properties related to the selection of the chosen variables and how their choice was justified.

We selected our criterion and antecedent variables in the PIAAC based on the results of that meta-analysis (Cerasoli *et al.*, 2018) and on a theoretical model of learning in the workplace (Illeris, 2004). This model proposes a process that describes motivation, readiness and learning strategies associated with the opportunities offered by the environment (family, school, work). The PIAAC variables related to that process are Readiness to Learn and ILBs. That environment, in work contexts, would include technical-organizational and sociocultural characteristics (Illeris, 2004). They are operationalized, respectively, by the variables Autonomy and Interaction in the Workplace in the PIAAC. The aforementioned model proposes that the learning process in the workplace occurs in conjunction with those two types of characteristics of the work context. These two types of work contexts may be associated with those social and structural dimensions proposed by Ellström (2011).

The PIAAC does not use the definition of ILBs proposed by Cerasoli *et al.* (2018). It uses other terms such as “informal learning”, “workplace learning”, “on-the-job learning” and “learning environment” (OECD, 2011). The three PIAAC items referring to them involve three aspects of activities or behaviors related to informal learning: learning from oneself, learning from others and learning from non-interpersonal sources (Noe *et al.*, 2013). The PIAAC developers did not use the ILBs definition, as it was recently adopted (Decius *et al.*, 2019; Wolfson *et al.*, 2018; Wolfson *et al.*, 2019).

The PIAAC items cover Workplace Autonomy in relation to the sequence of tasks, work methods, speed or rate of work and hours of work (OECD, 2011). Workplace Autonomy refers to workers being able to exert control and influence over their immediate work activities. It refers to the scope of latitude to make decisions about the content, methods, scheduling, and performance of work tasks (Breugh, 1985). Workplace Autonomy is an

important prerequisite for informal learning and, therefore, one of the drivers of skills acquisition (Borges-Andrade and Sampaio, 2019; Kortsch *et al.*, 2019).

Informal learning highlights the importance of learning from others, of space for individual desire and of acting to learn (Encinar-Prat and Gairín Sallán, 2019). Individuals, through social interaction with their context, receive the influences that they absorb through their psychological processes of interpretation and acquisition (Illeris, 2004). In the PIAAC, Interaction in the Workplace covers items related to teaching, giving presentations, planning the activities of others, advising, selling, negotiating, and influencing people (OECD, 2011). Thus, it is a way to operationalize social interaction.

The PIAAC items that refer to Readiness to Learn were based on the deep learning approach of Kirby *et al.* (2003). Deep learning occurs when individuals seek meaning and understanding and are intrinsically motivated to learn the subject and acquire competence in the area. Deep learning would allow reflection on past experiences to deal with new challenges, ensuring the adaptation of workers (Kirby *et al.*, 2003; Kowalski and Russell, 2020). The set of these items was renamed Readiness to Learn. It consists of a combination of items that involve motivation to learn and intrinsic reflection learning strategies (Gorges *et al.*, 2016; Smith *et al.*, 2015). Readiness to learn has a dispositional nature and is included in the theoretical model proposed by Illeris (2004). It can be a promising antecedent of ILBs because it combines learning orientation as a goal and motivation to learn.

Considering this meta-analysis, the theoretical model of Illeris (2004), and the PIAAC items, we hypothesize that ILBs are positively and significantly associated with the following:

H1. Workplace Autonomy;

H2. Interaction in the Workplace; and

H3. Readiness to Learn.

Our sample includes several countries, occupations, and generations. This differs from the research samples used by the research studies that reported the results analyzed by Cerasoli *et al.* (2018). Therefore, we did not speculate whether one variable predicts better than the others. We only tested a parsimonious model of predictive variables for ILBs based on a broader theoretical model proposed by Illeris (2004). Before that, we identified the need to verify that all the scales we intended to use would maintain the same number of items and that the data would properly fit this model. Our approach differs from other studies that used PIAAC data. They only selected the items of interest and did not provide justification for such aggregation.

Method

Sample and Procedure

We used data selected from the first PIAAC cycle (OECD, n.d.b). The survey was carried out in countries in Europe, Asia and America in three rounds that took place from 2011-2012 (21 countries), 2014-2015 (eight countries) and 2017-2018 (five countries). In total, around 250,000 adults aged between 16 and 65 were surveyed, representing 815 million adults in the same age group. The questionnaires were written in the official languages of each country. They were administered by an interviewer, who filled in the information obtained from the respondents on a computer. Most participants (45.1%) answered the survey in the living room (living/dining room) of their respective homes. Only 8.2% of participants answered the survey in a space outside their homes. Several databases did not include the respondents' profession. A diversity of professions appeared in the databases that included this variable. Therefore, we were not able to group them into categories.

We extracted a sample of 122,897 participants who worked when the PIAAC data collection took place. They were paid for their work and answered all items of the variables of our study: 50.6% men; 20.7% between 36 and 43 years old; and 33.7% were managers.

They had completed high school (49.9%); did not need additional training (63.9%); were hired indefinitely (54.8%); worked in organizations that increased the number of their workers (45%); and were working for the private sector (69.9%). We randomly divided that extracted sample into three databases ($n = 61,560$; $n_1 = 30,606$; $n_2 = 30,731$) to verify the measurement model. For the test of hypotheses for predicting ILBs, we used the whole sample.

Instruments

We extracted the items that operationalize the criterion and antecedent variables from the Background Questionnaire (OECD, n.d.a) (Table I). These items use a five-point Likert response scale, which ranges from not at all (1) to a very high extent (5) (Autonomy in the Workplace and Readiness to Learn) and from never (1) to everyday (5) (Interaction in the Workplace and ILBs).

[INSERT TABLE I]

We selected the following characteristics as control variables: 1) personal: sex, age group, and education; and 2) work or organizational: type of contract (indefinite time vs. other types of contract), need for additional training (yes or no), occupation level (manager or not), sector of the organization (public, private, or third sector) and increased number of people hired by the company (yes, no, or remained the same). These control variables were selected because they had significant effects in other studies (Brandão *et al.*, 2012; Ferreira *et al.*, 2018; Hoffman *et al.*, 2015; Moraes and Borges-Andrade, 2015; Pineda-Herrero *et al.*, 2017; Wolfson *et al.*, 2018). The only exception was the variable "need for additional training". We did not find studies that empirically investigated its relationship with informal learning. However, as informal learning is considered an alternative to training, we supposed that the participants' need for additional training could be reduced by informal learning behaviors (especially if there were no formal learning activities).

Data Analysis

We inspected the databases using SPSS software, version 24 (IBM), to verify that all assumptions were met. There were no problems regarding normality, multicollinearity, homoscedasticity, linearity, or the presence of multivariate outliers. We performed exploratory factor analysis (EFA) with all the selected items in the sample of 61,560 respondents. The decision on the number of factors to be retained was made by Exploratory Graphical Analysis in R (Golino *et al.*, 2020). The extraction method was Principal Axis Factoring, with oblique Promax rotation. We analyzed the reliability of the factors by calculating Cronbach's alpha, with a minimum criterion of 0.70.

We tested two competing models in the Confirmatory Factor Analysis (CFA), with 18 items and 20 items, in the samples with 30,606 and 30,731 respondents, respectively. We used the maximum likelihood estimation method of AMOS software, version 24 (IBM). We identified the fit of the models with the following indices (DiStefano, 2016): Akaike Information Criterion (AIC), which presents the lowest value when the models are compared; Standardized Root Mean Square Residual (SRMR) less than 0.08; Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) greater than or equal to 0.95; and Root Mean Square Error of Approximation (RMSEA) with values up to 0.05.

Based on the correlation matrix, we calculated the hierarchical multiple regression in SPSS, version 24 (IBM), for the criterion variable ILBs, by the Enter method. We inserted the control variables in the first step (Model 1). Then, we added the three significantly correlated antecedent variables (Model 2). We created dummy variables for age group (16-27; 28-35; 36-43; 44-51; and 52-65 years old), education level (up to high school and above) and type of contract (indefinite time and others). Among the significant control variables in Model 2, we identified differences in ILBs medians by the Mann-Whitney *U* and Kruskal-Wallis *H* tests.

Results

Exploratory (EFA) and Confirmatory (CFA) Factor Analysis

In EFA, Bartlett's sphericity tests (402457.469, $df = 153$, $p < 0.001$), Kaiser-Meyer-Olkin (KMO = 0.87) and matrix determinant (0.001) suggested interpretability of the correlation matrix of the items. We excluded items with a factor loading of less than 0.32. No item was removed because it showed significant contributions in more than one factor. We found that the removal of items D_Q11d and F_Q02d (factor loading of 0.37, close to the exclusion criterion) would improve the reliability indices of their respective factors and the model variance (60.24%). Table II shows the four factors, their Cronbach alphas, and the factor loadings of their items.

[INSERT TABLE II]

In CFA, the model with 18 items showed better fit indices (CFI = 0.94, TLI = 0.93, RMSEA = 0.05, SRMR = 0.04, AIC = 13394.959) than the model with 20 items (CFI = 0.92, TLI = 0.90, RMSEA = 0.06, SRMR = 0.04, AIC = 18828.267). The fit indices were similar, but a lower AIC indicated that the 18-item model was better.

Test of Hypotheses

The correlations between variables are shown in Table III.

[INSERT TABLE III]

The results of the hierarchical multiple regression confirmed the three hypotheses (Table IV). In Model 1 of the regression, the explanatory power was 9.3% ($F = 984.838$, $p < 0.001$). When the antecedent variables were inserted (Model 2), the explanatory power increased to 21.2% ($F = 3846.559$, $p < 0.001$). The variable with the highest explanatory value was Interaction in the Workplace ($\beta = 0.31$, $p < 0.001$). ILBs were predicted by two personal characteristics (age and education) and three work or organizational characteristics

(number of people hired by the organization, level of occupation, and need for additional training).

[INSERT TABLE IV]

The variances of demographic indicators that were associated with ILBs are not homogeneous. Thus, nonparametric tests evaluated the differences in the ILB medians. This median was significantly higher for managers ($Mdn = 3.67$) than for nonmanagers ($Mdn = 3.33$), based on the Mann-Whitney test, $U(N_{\text{managers}} = 33.483, N_{\text{nonmanagers}} = 81.541) = 1144025015, z = -43.392, p < 0.001$. This test also indicated a significantly higher median for individuals who indicated an additional need for training ($Mdn = 3.67$) compared to those who did not indicate this need ($Mdn = 3$); $U(N_{\text{yes}} = 44.236, N_{\text{no}} = 78.560) = 1303152688, z = -73.144, p < 0.001$. The Mann-Whitney U test also indicated a significantly higher ILB median for respondents with education higher than High School ($Mdn = 3.67$) compared with those with education up to High School ($Mdn = 3.33$); $U(N_{\text{uptoHighSchool}} = 61.321, N_{\text{higherthanHighSchool}} = 55.550) = 1462675881, z = -41.924, p < 0.001$.

The Kruskal-Wallis H test showed that age group was significantly associated with ILBs, $H(4) = 1521.246, p < 0.001$. Participants aged 16 to 27 years old ($Mdn = 3.67$) had values higher than those aged 28 to 35 years old ($Mdn = 3.33$), 36 to 43 years old ($Mdn = 3.33$), 44 to 51 years old ($Mdn = 3.33$) or 52 to 65 years old ($Mdn = 3$). The variable number of people hired by the company had a significant association with ILBs, $H(2) = 943,302, p < 0.001$. Individuals who said that the number of people increased in the organization ($Mdn = 3.67$) had higher medians than those who said that this number decreased ($Mdn = 3.33$) or that it remained the same ($Mdn = 3.33$).

Discussion

The results confirmed the adequacy of our decision to perform new EFA and CFA to examine evidence of validity of the factorial structure of the selected items of the PIAAC and

its internal consistency. The measurement model obtained with the removal of two items showed better reliability indices. The CFA fit indices are very close to ideal. The indicators related to residuals are excellent. CFI and TLI did not present a value equal to or greater than .95. However, a CFI with a value equal to or greater than .93 is sufficient to indicate a good fit of the model (Byrne, 2005).

Situational factors - Autonomy and Interaction in the Workplace - and a dispositional characteristic - Readiness to Learn - positively predict ILBs. These findings support the model proposed by Illeris (2004): learning occurs in a dynamic relationship between individual acquisition processes - represented by the variables Readiness to Learn and Informal Learning Behaviors and the technical-organizational and sociocultural environments - represented by the variables Autonomy and Interaction in the Workplace, respectively.

Workplace Autonomy showed the lowest correlation and effect scores, despite being considered a relevant antecedent of ILBs (Cerasoli *et al.*; 2018, Noe *et al.*, 2017; Takase *et al.*, 2018). Greater autonomy is related to greater involvement with learning (Borges-Andrade and Sampaio, 2019). A study on autonomy and informal learning determined three ILBs: learning from oneself, learning from others and learning from non-interpersonal sources (Kortsch *et al.*, 2019). These behaviors are similar to those used in PIAAC. The results of the authors indicated that the autonomy values varied according to the preference for different types of informal learning behaviors. Our study aggregated three types of ILBs, which may have contributed to the lower values of Autonomy in the Workplace. Another explanation may be the nature of the PIAAC sample, which is heterogeneous; most studies related to Workplace Autonomy used samples by convenience and probably more homogeneous than ours. The results of these studies may have biases from those samples.

Interaction in the Workplace showed the highest correlation and effect scores with ILBs. Interpersonal relationships can be relevant for informal learning. Interaction in the

Workplace comprises items related to teaching and giving presentations. These characteristics show some similarity with formal teaching activities or in the workplace itself. Other studies related to teaching activities also indicate that a large part of informal learning occurs during work. Teaching may benefit the learning of others and of oneself. Teaching activities may trigger ILBs to meet demands (Grosemans *et al.*, 2015; Lecat *et al.*, 2019). The more people reported having participated in outreach events, the more knowledge sharing relationships they had (Hoffman *et al.*, 2015). In addition to these teaching activities, Interaction in the Workplace brought together activities related to planning the work of others and advising, negotiating, and influencing people. In the PIAAC data for Spain, advising, teaching, and negotiating with others were among the most frequent interaction activities (Pineda-Herrero *et al.*, 2017). Working in groups with individuals with different knowledge and skills helps to understand these skills and make better use of them, allowing the exchange of information and feedback, which promotes informal learning (Eraut, 2011). Frequent contacts with colleagues from other workplaces and clients can promote extrinsic reflection learning strategies (associating their own work activities with external goals and demands). The absence of these contacts would hinder such reflections due to the absence of external referents for the work activities themselves, which would reduce the perception of meaning of the tasks.

Readiness to Learn also was a significant antecedent of ILBs. Readiness to Learn is a PIAAC creation; therefore, only studies that used its data refer to this nomenclature. To interpret the results, we sought indicators of items that form Readiness to Learn, such as motivation and learning goal orientation. These indicators are relevant antecedents (Cerasoli *et al.*, 2018) and are included in the theoretical model of Illeris (2004). Data from the first round of the PIAAC with 20 countries - we used all the data from the first cycle of the PIAAC - also found a positive relationship between Readiness to Learn and ILBs (Ferreira *et*

al., 2018). However, these authors used the term Elaborate Learning to designate Readiness to Learn. Other recent studies have also indicated that informal learning is positively related to learning goal orientation (Noe *et al.*, 2017) and motivation (Lee *et al.*, 2019).

Younger people with higher educational levels had higher ILB scores. The intensity of informal learning in the workplace decreased with age, and the level of education was positively correlated with informal learning in the study by Ferreira *et al.* (2018). Individuals with low educational levels have fewer opportunities for informal learning, and younger individuals probably benefit from informal learning, as suggested by Pineda-Herrero *et al.* (2017). No relationship between age and learning activities was found by Froehlich *et al.* (2020). The authors attributed these results to the sample, formed by consulting professionals. Due to rapidly changing job requirements, they must be motivated to learn to ensure their employability, regardless of age. Other variables - such as family status, psychosocial experience and health - may provide a more accurate understanding of the relationship between age and informal learning.

Our findings, from the PIAAC sample, probably allow better generalization for different countries, occupations, and age groups and may reduce that need for more studies in a globalized work scenario (Noe *et al.*, 2014). Thus, they suggest that global policies to increase education, which have effects on the development of competencies acquired in formal learning, may also have effects on ILBs. These, in turn, could promote the development of competencies in the workplace. That is, such policies could have direct and indirect effects on competencies developed in the educational and work contexts, respectively. The negative relationship between age and ILBs also suggests the need for global policies that promote them among older people.

The need for additional training, occupation level and increased number of people hired by the organization were associated with ILBs. Other studies have already indicated

that managers tend to have a higher frequency of informal learning in the workplace (Brandão *et al.*, 2012; Ferreira *et al.*, 2018), occupy a prominent position in influencing information sharing (Hoffman *et al.*, 2015), and promote more informal learning in organizations (Pineda-Herrero *et al.*, 2017). It is likely that managers have higher scores in Interaction in the Workplace due to their attributes of control over other people, goals and demands. We did not test this relationship, but it would be interesting for future studies to address this issue.

The size of the organization may also be associated with ILBs (Moraes and Borges-Andrade, 2015). These authors found a similar result in their study with municipal employees in the first year of the elective term. The authors indicated that the learning in the workplace scores were also higher in larger municipalities. The intensity of informal learning in the workplace tends to be significantly higher for individuals employed in larger companies (Ferreira *et al.*, 2018), with positive correlations as the number of individuals increases (Wolfson *et al.*, 2018). Larger organizations probably have more complex demands and more often. This may intensify the issuance of ILBs to develop competencies to deal with such demands. Regarding the need for additional training, we found no other studies that correlate its relationship with ILBs. Our assumption is that if a person does not have access to formal learning, he/she tends to seek qualification through ILBs to meet a perception of the need for additional training. In addition, this perception of need may induce the orientation towards learning and the motivation to learn.

Limitations and Future Research

We analysed secondary data. Therefore, we did not have control over the use of the measurement instruments. We tried to solve this problem by carefully reading the PIAAC documentation and comparing its constructs with the findings of the relevant scientific literature. We also sought not to reproduce the factorial structure presented in the PIAAC

documents (OECD, 2019) and produced evidence in new EFA and CFA. Our measurement model showed better fit indices than the original PIAAC model. Thus, we were able to obtain accurate information, both in the theoretical and statistical aspects. Future researchers who intend to use the PIAAC data are suggested to take the same care.

We could not separate the types of ILBs. This separation could find specific antecedents for each of these behaviors. Future studies should be aware of this. The relationship between antecedents and ILBs may be more complex than previously thought, with some antecedents predicting some types of behavior and not others.

The relevance of the Interaction in the Workplace factor may contribute to research on learning in work teams. The increased use of teams as a strategy to improve the performance of organizations may be linked to team dynamics, which involves high interaction among its members. Teamwork can promote the exchange of knowledge and expertise, which may improve individual learning (Eraut, 2004). Future research should explore whether work teams enhance informal learning in the workplace, mediated by Interaction in the Workplace.

Future research should also consider the impact of cultural differences on ILBs. The impact of culture on informal learning is suggested by Marsick (2009) and Noe *et al.* (2014). They point out that the impact of national culture on informal learning is still unknown and calls for further research. The potential moderating effects of national culture on the association between performance appraisal and informal learning was suggested by Bednall *et al.* (2014). They suggested that employees' perceptions of performance appraisal may differ according to their national culture, such as a high or low power distance culture or an individualistic or collectivist culture. The influence of national culture on relevant antecedents of informal learning using Hofstede's five cultural dimensions was theoretically described by Kim and McLean (2014). However, empirical studies investigating the relationship between culture and informal learning are rare.

Conclusion

Informal learning has become a strategic tool in the work world. In situations of constant technological change, structuring a training program is not always possible to obtain the necessary results in a timely manner. Employees must be encouraged to engage in informal learning to maintain a competent and employable workforce. Thus, it is necessary to understand the antecedents that promote ILBs, which in turn may result in the desired informal learning. The understanding of such antecedents - in various countries, occupations, and age groups - suggests a set of generalities that may support the establishment of global policies aimed at a worker qualification that is not limited to the provision of events that promote learning. Such policies may also be aimed at redesigning work, promoting interactions between individuals, and increasing their autonomy to perform tasks. In addition, the worker should be an agent of his/her own learning process: guided and motivated to develop competencies in his/her work context.

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Table I - Items selected from PIAAC

Factors	Items
Workplace Autonomy	To what extent can you choose or change: D_Q11a: the sequence of your tasks? D_Q11b: how you do your work? D_Q11c: the speed or rate at which you work? D_Q11d: your working hours?
Interaction in the Workplace	How often does your job usually involve: F_Q02b: instructing, training or teaching people, individually or in groups? F_Q02c: making speeches or giving presentations in front of five or more people? F_Q02d: selling a product or selling a service? F_Q02e: advising people? F_Q03b: planning the activities of others? F_Q04a: persuading or influencing people? F_Q04b: negotiating with people either inside or outside your firm or organization?
Readiness to learn	I_Q04b: When I hear or read about new ideas, I try to relate them to real life situations to which they might apply I_Q04d: I like learning new things I_Q04h: When I come across something new, I try to relate it to what I already know I_Q04j: I like to get to the bottom of difficult things I_Q04l: I like to figure out how different ideas fit together I_Q04m: If I don't understand something, I look for additional information to make it clearer
Informal Learning Behaviors (ILBs)	D_Q13a: In your own job, how often do you learn new work-related things from co-workers or supervisors? D_Q13b: How often does your job involve learning-by-doing from the tasks you perform? D_Q13c: How often does your job involve keeping up to date with new products or services?

Table II - Four-factor structure of the selected PIAAC items, extracted by Exploratory Factor Analysis and Cronbach's alpha (n = 61,560)

Items	RtL	WA	IT	ILB
I_Q04l	0.79			
I_Q04j	0.73			
I_Q04d	0.72			
I_Q04h	0.72			
I_Q04m	0.70			
I_Q04b	0.59			
D_Q11b		0.82		
D_Q11a		0.79		
D_Q11c		0.75		
F_Q04a			0.79	
F_Q02e			0.68	
F_Q04b			0.68	
F_Q03b			0.62	
F_Q02b			0.58	
F_Q02c			0.52	
D_Q13b				0.78
D_Q13a				0.75
D_Q13c				0.45
Cronbach's alpha	0.86	0.83	0.82	0.71

Notes: WA = Workplace Autonomy; ILB = Informal Learning Behaviors; IT = Interaction in the Workplace; RtL = Readiness to Learn

Table III - Correlations between all variables used in hierarchical multiple regression analysis (n = 122,897)

	ILB	Age	Ed	Cont	Sex	Sector	Amt	Mng	Train	WA	RtL	IW
ILB	-											
Age	-0.14*	-										
Ed	0.14*	0.01*	-									
Cont	-0.02*	-0.23*	-0.12*	-								
Sex	-0.01	0.02*	0.10*	0.00	-							
Sector	0.04*	0.14*	0.22*	-0.05*	0.17*	-						
Amt	-0.09*	0.04*	-0.06*	0.06*	0.05*	0.03*	-					
Mng	-0.14*	-0.08*	-0.16*	0.16*	0.11*	-0.01*	0.09*	-				
Train	-0.21*	0.07*	-0.08*	-0.04*	0.02*	-0.04*	0.04*	0.06*	-			
WA	0.15*	0.02*	0.16*	-0.13*	-0.02*	0.03*	-0.06*	-0.21*	-0.04*	-		
RtL	0.30*	-0.11*	0.22*	-0.05*	-0.01*	0.07*	-0.07*	-0.14*	-0.08*	0.25*	-	
IW	0.37*	0.02*	0.33*	-0.17*	-0.01*	0.13*	-0.11*	-0.47*	-0.14*	0.32*	0.33*	-

Notes: ILB = Informal Learning Behaviors; Age = Age Group; Ed = Education Level; Cont = Type of Contract; Sex = Sex; Sector = Economy Sector; Amt = Increase in the number of people hired; Mng = Occupation level; Train = Need for additional training; WA = Workplace Autonomy; RtL = Readiness to Learn; IW = Interaction in the Workplace. *Correlation is significant at the 0.01 level (two-tailed)

Table IV - Results of the hierarchical multiple regression analysis (n = 122,897)

Variable	<i>B</i>	<i>SE</i> of <i>B</i>	β	<i>p</i>	95% CI for <i>B</i>		<i>R</i> ²	ΔR^2
					LB	UB		
Model 1							0.09	0.09
Constant	4.68	0.03		0.00*	4.62	4.74		
Age	-0.11	0.00	-0.14	0.00*	-0.11	-0.10		
Education	0.19	0.00	0.09	0.00*	0.18	0.21		
Type of Contract	-0.07	0.00	-0.03	0.00*	-0.09	-0.06		
Sex	0.01	0.01	0.00	0.54	-0.01	0.02		
Economy Sector	0.06	0.01	0.03	0.00*	0.05	0.08		
Number of people working in the company increased	-0.08	0.01	-0.06	0.00*	-0.09	-0.07		
Manager or not	-0.26	0.01	-0.11	0.00*	-0.28	-0.25		
Need more training	-0.42	0.01	-0.19	0.00*	-0.43	-0.40		
Model 2							0.21	0.12
Constant	2.29	0.04		0.00*	2.22	2.26		
Age	-0.08	0.00	-0.11	0.00*	-0.09	-0.08		
Education	-0.03	0.01	-0.01	0.00*	-0.05	-0.02		
Type of Contract	0.00	0.01	0.00	0.60	-0.01	0.02		
Sex	0.01	0.01	0.00	0.21	-0.01	0.02		
Economy Sector	-0.01	0.01	0.00	0.47	-0.02	0.01		
Number of people working in the company increased	-0.05	0.00	-0.04	0.00*	-0.60	-0.04		
Manager or not	0.09	0.01	0.04	0.00*	0.07	0.11		
Need more training	-0.33	0.01	-0.15	0.00*	-0.35	-0.32		
Autonomy in the Workplace	0.02	0.00	0.02	0.00*	0.01	0.03		
Readiness to Learn	0.26	0.00	0.18	0.00*	0.25	0.27		
Interaction in the Workplace	0.29	0.00	0.31	0.00*	0.28	0.30		

Notes: * $p < 0.001$

The Role of Participation in Training in the Relationship between Informal Learning and its Antecedents

Abstract

We investigated the relationships between Participation in Training, Informal Learning Behaviours (ILBs), and their dispositional (Readiness to Learn) and situational (Workplace Interaction and Autonomy) antecedents. Aiming to produce findings with greater reproducibility and generality, we used secondary data from 34 countries participating in the first cycle of the Programme for the International Assessment of Adult Competencies, but we also compared these countries. We randomly selected a sample of 504 respondents from each country who were divided equally into training and non-training participant groups. Then, we aggregated the sample of all countries ($n = 17,136$). The group that participated in training achieved higher mean ILBs with lower variance. In the aggregated sample, Participation in Training moderated only the relationships between ILBs and their situational antecedents. Workplace Interaction and Autonomy were more strongly associated with ILBs among non-training participants. Moderation findings differed among countries. Aspects of job design should be considered—in addition to the skills developed in training—to improve the use of learning opportunities at the workplace. This implication is based on diverse education levels, occupations, age groups, and countries, better supporting global policies. Autochthonous features that may moderate the prediction of ILBs deserve further investigation. Specific training and other dispositional and job design predictors should be longitudinally investigated in the future.

Keywords: participation in training, informal learning behaviors, workplace interaction, workplace autonomy, readiness to learn.

Introduction

The world of work is undergoing accelerated economic, technological, and social transformations. Work can occur in environments where these transformations demand intentional learning behaviours that involve effort or persistence—whether as an obligation or a challenge (Borges-Andrade, 2019). In these complex and dynamic contexts, students, professionals, and organizations turn to workplace learning as a strategic tool to ensure competitiveness. Supposedly, this learning can provide better performance (Park & Choi, 2016), decrease feelings of job insecurity (De Cuyper et al., 2022), increase employability (Naval et al., 2020), and higher early career income (Plasman & Thompson, 2023).

The term ‘workplace learning’ includes formal and informal learning. The former comprises competences acquired during training outside the workplace and planned and organized learning that emerges in this workplace. The latter refers to competences acquired while on the job (Stern & Sommerland, 1999). Some professional careers emphasize formal learning of job-related tasks (Billett, 2002). However, informal learning may be more relevant in the workplace (Tynjälä, 2008). What relationships might exist between these two learning modalities?

The perceived relationships between informal and formal learning are not fully understood, creating a significant research gap. Filling this gap with broader scientific evidence is crucial to support investment policies in various national scenarios and contribute to achieving the fourth United Nations Sustainable Development Goal: “Quality education: ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.” This goal is particularly relevant as training, development, and education often demand financial resources and time that are not always readily available. On the other hand, informal learning can be more accessible as it takes place on the job. Understanding the dynamics between these learning modalities and whether participation in training can

contribute to predicting Informal Learning Behaviours (ILBs) is a critical step in optimizing investment decisions. These behaviours may depend on dispositional and situational factors, and this process may be moderated by participation in training. Testing this moderating effect is one of our primary objectives. We found no published studies that have performed such an analysis, underscoring the novelty and importance of our research. However, some studies have indicated commonalities between some antecedents of both learning modalities, as described in the subsequent sections.

Scientific evidence collected based on samples from different national scenarios, occupations, education levels, and age groups enables greater generalization of the results and, therefore, supports those investment policies and contributes to that fourth sustainable development goal. With this in mind, our study uses secondary data from the Programme for the International Assessment of Adult Competencies (PIAAC) of the Organization for Economic Cooperation and Development (OECD). Analysing the open PIAAC data allows for more robust conclusions and greater transparency regarding the results obtained, allowing for the reproduction of findings. The poor reproducibility of studies in the Human Sciences has been the subject of several criticisms (Sarafoglou et al., 2020). One of the significant limitations of these studies is the use of samples with few participants and/or samples concentrated in a few countries. The present study addresses this limitation by including a large-scale international sample to test a model for predicting ILBs by dispositional and situational factors – moderated by participation in training. However, countries may vary in how they establish policies to validate informal learning (Assinger & Biasin, 2023) and how their organizations and workers value and undertake informal learning processes and activities (Annen, 2023). These differences may impact those factors and that participation. Therefore, we also aimed to identify differences in the prediction of ILBs in different countries, but our hypotheses were solely formulated for the aggregated sample.

Theoretical Framework

Learning includes acquiring, developing, and retaining competences (knowledge, skills and affect) over time to be applied when necessary (Kraiger & Ford, 2021). However, there are different types of learning in the workplace. Those types of learning are part of a continuum that ranges from informal learning – that happens on the job – to formal learning – that emerges in a structured educational environment (Janssens et al., 2017).

To achieve our research objective, we adopted the 3-P (Presage – Process – Product) model of workplace learning from Tynjälä (2013). It is a holistic model suitable for analysing the complex interactions of data with the sample diversity of the PIAAC. It is divided into three dimensions: a) Presage: comprises the learner's interpretations of individual factors (knowledge and prior experience, skill, agency and commitment, motivation, self-confidence, life situations) and the learning context (organizational and work structures, human resources development, team expertise, manager support, collaborative climate, orientation toward learning and innovation, partnerships and networks); b) Process: refers to learning (non-intentional, intentional, informal, nonformal, formal) by doing one's work (reflecting on and evaluating work experiences, collaborating and interacting with other people, participating in networks, facing new challenges and tasks, and participating in training); and c) Product: covers learning outcomes (from the acquisition of skills to performance and productivity, among others). Thus, learner and contextual factors (Presage) influence learning activities (Process), which, in turn, affect the learning results (Product) (Tynjälä, 2013).

The Process dimension involves the activities people learn at work and does not distinguish between formal and informal learning modalities (Tynjälä, 2013). This author mentions that the usefulness of this distinction is contested by Billett (2002) and Cairns and Malloch (2011). The lack of consensus on the distinction between these modalities is

probably due to their definition. Both lead to the acquisition of skills. However, the types of behaviours involved differ.

Formal learning and informal learning

There are a few differences in the definitions of formal learning. In general, formal learning results from learning activities planned to help individuals acquire the necessary skills to perform their jobs well. These activities include almost all training and development programmes organizations offer (Eraut, 2000; Marsick & Watkins, 1990, 2001). Therefore, training occurs in a context designed specifically for learning, so we refer to it as formal learning.

The most significant divergences occur in the definition of informal learning, especially regarding whether the learning is intentional or incidental. It tends to be defined around what is not formal, and there is little agreement on how this term should be defined or used (Colley et al., 2002). Informal learning assumes that the acquisition of competencies in the work environment does not occur only through organized programmes but manifests itself during critical moments of need in the actual work environment (Manuti et al., 2015). Informal learning is often intentional but not structured or contextualized (Marsick, 2009). It is characterized as implicit, unintentional, opportunistic, unstructured, and without the presence of a teacher (Eraut, 2004).

Workers' activities that are predominantly self-directed and intentional and happen in the workplace—at the service of acquiring knowledge and skills—were defined as Informal Learning Behaviours (ILBs) (Cerasoli et al., 2018). These behaviours can be operationalized as learning from oneself, learning from others, and learning from no interpersonal sources (Noe et al., 2013). They are initiated by the individual outside the formal learning environment (Sparr et al., 2017). In this study, we adopted the definition of ILBs from

Cerasoli et al. (2018). Thus, we assume these behaviours are intentional, although the individual must be ready to learn.

Formal learning opportunities can stimulate informal learning in the short and long term (Bednall & Sanders, 2017). Additionally, three types of ILBs— seeking interpersonal help, help from written material, and practical application—may stem from satisfaction with training (Richter et al., 2020). When this satisfaction results from the reflections of training participants, they use informal learning more (Kortsch et al., 2019). However, compared to permanent employees, temporary workers participate in fewer training sessions and engage more intensely in informal learning (Ferreira et al., 2018). Nonetheless, these authors found evidence of complementarity between participation in training and informal learning for people in both types of employment.

Training actions and ILBs are included in the Process dimension, according to the model by Tynjälä (2013). Although this author does not differentiate between the learning modalities and the activities that lead to them, a better understanding of this dimension may require further studies that distinguish them. That would enable to identify whether participation in training affects the dynamics between the Process dimension and the Presage dimension or between ILBs and their individual and situational antecedents. Based on the research findings mentioned in the previous paragraph, we assume a positive association between training and ILBs. That is, these behaviours intensify when someone participates in training. Thus, we formulate:

Hypothesis 1: Participation in training is positively related to ILBs, and the means of these behaviours—in the group of training participants—is significantly greater than the means in the group of nonparticipants.

Training, ILBs, and their antecedents

The antecedents of ILBs can be both dispositional and situational (Cerasoli et al., 2018). Some examples of the former, cited by these authors, were sociodemographic factors, personality, motivation to learn, and orientation toward learning as a goal. For situational factors, the authors indicated job design characteristics, such as workload, interaction (supervisors, colleagues) and autonomy, organizational support, opportunities to learn, and type or sector of the organization. Similar results regarding the antecedents of ILBs were found in the literature review by Jeong et al. (2018). These antecedents can occur at three levels: a) individual: sociodemographic or personal characteristics (e.g., personality, motivation to learn) and job characteristics (e.g., commitment to professional development, task autonomy); b) group: leadership (e.g., managerial/supervisory support), feedback, networking and interpersonal relationships; and c) organizational: organizational characteristics, interventions and culture, and work resources and tools. For the present study, we selected Readiness to Learn, Workplace Interaction, and Autonomy—significant antecedents of ILBs in a study that used PIAAC data (Lucena Barbosa & Borges-Andrade, 2022).

Readiness to Learn is a dispositional construct created by the developers of PIAAC (OECD, 2019). It combines motivation to learn and intrinsic reflection (Gorges et al., 2016; Kirby et al., 2003; Smith et al., 2015). Motivation to learn was associated with participation in adult education and training and directly impacted learning transfer, according to the studies of Yamashita et al. (2019) and Lim et al. (2020). The process of active reflection on what was learned during training led to an increase in learning, as well as an increase in subsequent job performance, compared to simply reading texts (Wang et al., 2022). Reflection was positively related to the transfer of training, and its interaction with the search for feedback intensified this positive effect (Sparr et al., 2017). Formal and informal learning were positively associated with personal orientation toward learning (Choi & Jacobs, 2011).

Readiness to Learn belongs to the Presage dimension (learner factors) in the 3-P model by Tynjälä (2013). This dimension influences the Process dimension. The findings mentioned in the previous paragraph suggest that Readiness to Learn can also influence formal learning. The 3-P model does not distinguish between learning modalities and their respective behaviours (Tynjälä, 2013). Therefore, components of the Presage dimension influence both learning modalities. As a result, we hypothesized that participation in training may positively alter the prediction of ILBs by readiness to learn:

Hypothesis 2: Participation in training moderates the relationship between Readiness to Learn and ILBs—this relationship is stronger among training participants than nonparticipants.

Training can help workers develop skills, knowledge, and confidence to work autonomously and choose the ideal working method. The degree of training specialization and workers' autonomy influence occupational mobility (Hout, 1984). A listening training programme was positively associated with increased teacher autonomy levels (Itzchakov et al., 2023). The amount of control or Workplace Autonomy was identified as an important predictor of training effectiveness (Huczynski & Lewis, 1980; Vandenput, 1973). Those with more control over their work may create more opportunities to transfer training in the long run than those with less autonomy (Axtell et al., 1997).

Workplace Autonomy is a situational variable included in the Presage dimension (Tynjälä, 2013). The findings described in the previous paragraph, and those of Cerasoli et al. (2018), Lucena Barbosa and Borges-Andrade (2022), and the 3-P model (Tynjälä, 2013) support the assumption that Workplace Autonomy is an antecedent of formal and informal learning modalities. As with Readiness to Learn, we assumed that participation in training could also strengthen the relationship between Workplace Autonomy and ILBs, and we formulated the following hypothesis:

Hypothesis 3: Participation in training moderates the relationship between Workplace Autonomy and ILBs—this relationship is stronger among training participants than nonparticipants.

People learn from their experiences and behaviours as the result of these people's interactions with their context, according to the Field Theory (Lewin, 1951). Thus, it is reasonable to assume that Workplace Interaction has a positive relationship with training, and there are findings from studies on training that confirm this assumption. For example, a listening training programme increases relational energy, which occurs when interactions at work improve performance due to the high quality of interpersonal relationships (Itzchakov et al., 2023).

Like Workplace Autonomy, Workplace Interaction is a situational variable and integrates the Presage dimension of the 3-P model (Tynjälä, 2013). The results described in the previous paragraph suggest a positive relationship between training and Workplace Interaction. In addition, this model assumes that Workplace Interaction may be related to training. Thus, exposure to training has a positive and significant effect on the relationship between Workplace Interaction and ILBs:

Hypothesis 4: Participation in training moderates the relationship between Workplace Interaction and ILBs—this relationship is stronger among training participants than nonparticipants.

Method

Sample and procedure

We used the open database of PIAAC, which was collected between 2011 and 2018, to assess literacy, numeracy, and problem-solving skills in technological environments (OECD, nda). Adults were interviewed at home, and the questions were answered mainly via computer, although pencil and paper could also have been used. The questions were in

national languages and were the subject of cross-cultural and international validation, aiming to obtain comparable results. A second data collection cycle started in 2018 and will end in 2024 (OECD, 2013). We selected the available data on the incidence of training, informal learning, job design, and readiness to learn from respondents.

From the 34 PIAAC countries in Europe, the Americas, and Asia, we selected only those respondents who indicated they were working during data collection. We excluded all cases with missing data for the independent and dependent variables. To ensure a balanced sample, we limited the country-size samples so that the groups of training participants and non-training participants had the same number of respondents. The country with the lowest number of training participants ($n=252$) was identified, and we randomly selected an equal number of participants or nonparticipants from all countries. This process resulted in each national sample having 504 participants, and we aggregated this data into a single file ($n=17,136$). This sample comprised 50.7% of men, with a mean age of 39.38 years ($SD = 11.85$), and 52.6% had completed high school. They worked in the private sector (69.2%), had an indefinite-term employment contract (62.8%), and did not hold managerial positions (65.9%).

Instruments

We extracted all the information from the items of the Background Questionnaire of the PIAAC (Organization for Economic Co-operation and Development [OECD], ndb) for that aggregated sample. A confirmatory factor analysis (CFA) of these data indicated a good fit of the model with the independent and dependent variables of our study ($\chi^2 = 7827$, d.f. = 129; CFI = 0.93, TLI = 0.92, RMSEA = 0.06, 90% CI [0.057–0.060], SRMR = 0.04). Table 1 describes these variables and the moderating variable (dichotomous), their response scales and reliability indices, and their items and respective codes.

[INSERT TABLE 1]

Data analysis

We analyzed descriptive statistics, reliability indices, and point-biserial correlations between the variables and CFA of the model with our three independent variables (workplace interaction and autonomy and readiness to learn) and dependent variables (ILBs) to the aggregated sample. To indicate a good fit, the comparative fit index (CFI) and Tucker–Lewis index (TLI) values must exceed 0.90, and the root mean square error of approximation (RMSEA) must be equal to or less than 0.06 (Hu & Bentler, 1999). A standardized root mean square residual (SRMR) lower than 0.08 indicates a good fit for the model (DiStefano, 2016). We performed a Welch *t*-test for independent samples to investigate differences between the dependent variable means (ILBs) of the groups of respondents who participated or did not participate in training to the aggregated sample. We accomplished moderation analyses on the aggregated and individual country samples to test whether participation in training interferes with the prediction of ILBs by those three independent variables. We used the software SPSS v.24 for all analyses. Findings are presented in the next section. Nonsignificant country results are in the Annex (Table 6).

Results

Aggregated sample

Table 2 shows the means, standard deviations, and correlations—all positive and significant—between the study variables. The variance in ILBs was not homogeneous between the groups that participated or did not participate in training (Levene(1) = 197.0, $p < 0.001$).

The group of training participants had significantly greater means of ILBs ($M = 3.54$; $SD = 0.982$) than the nonparticipants. Therefore, Hypothesis 1 was confirmed. The latter group had greater standard deviations ($M = 3.12$; $SD = 1.124$), $t(16833) = 25.91$, $p < 0.001$, $d = 0.396$, according to the results of Welch's *t*-test for independent samples.

[INSERT TABLE 2]

The relationship between Readiness to Learn and ILBs was not significantly moderated by Participation in Training ($B = 0.048$, 95% CI [0.005, 0.090], $p = 0.028$). Therefore, Hypothesis 2 was not confirmed.

The interaction between Workplace Autonomy and ILBs was statistically significant, indicating a moderating effect ($B = 0.068$, 95% CI [0.039, 0.096], $p < 0.001$). When respondents participated in training, the relationship between Workplace Autonomy and ILBs was positive and significant ($B = 0.088$, $p < 0.001$). This relationship became stronger for those who did not participate in training ($B = 0.155$, $p < 0.001$). Therefore, Hypothesis 3 was partially confirmed. Figure 1 shows the effects observed.

[INSERT FIGURE 1]

The relationship between Work Interaction and ILBs was also significantly moderated by Participation in Training ($B = 0.108$, 95% CI [0.081, 0.135], $p < 0.001$). Similarly, the relationship between Work Interaction and ILBs was positive and significant ($B = 0.267$, $p < 0.001$) for training participants and stronger ($B = 0.375$, $p < 0.001$) for nonparticipants. Thus, Hypothesis 4 was also partially confirmed (Figure 2).

[INSERT FIGURE 2]***Country samples***

The relationship between Readiness to Learn and CAIs was significantly moderated by Participation in Training in only four countries: Kazakhstan, Slovenia, Poland, and Singapore (Table 3). The simple slopes analysis of the groups of the moderator variable Participation in Training indicated that the results of the group that did not participate in training were not significant for Slovenia (Yes: $B = 0.482$, $p < 0.001$; No: $B = 0.132$, $p = 0.152$). When respondents participated in training, the relationship between Readiness to Learn and ILBs was positive and significant. However, for those who did not participate, this

relationship became stronger in the results from Kazakhstan (Yes: $B = 0.222, p = 0.015$; No: $B = 0.505, p < 0.001$) and Singapore (Yes: $B = 0.296, p = 0.002$; No: $B = 0.668, p < 0.001$). The results from Poland indicated that the relationship between Readiness to Learn and ILBs was positive and significantly stronger for the group that participated in training ($B = 0.628, p < 0.001$) than for the group that did not participate ($B = 0.300, p = 0.001$).

[INSERT TABLE 3]

The relationship between Workplace Autonomy and ILBs was significantly moderated by Participation in Training in only five countries: Germany, Cyprus, Netherlands, New Zealand, and Singapore (Table 4). However, for Germany, Workplace Autonomy was not a significant predictor of ILBs ($B = -0.026, p = 0.578$). In addition, the simple slopes analysis of the groups of the moderator variable Participation in Training indicated that the results of the German group that did not participate in training were not significant (Yes: $B = -0.139, p = 0.025$; No: $B = 0.087, p = 0.192$). For Cyprus (Yes: $B = 0.003, p = 0.965$; No: $B = 0.195, p < 0.001$), the Netherlands (Yes: $B = 0.056, p = 0.398$; No: $B = 0.294, p < 0.001$) and New Zealand (Yes: $B = 0.060, p = 0.299$; No: $B = 0.221, p < 0.001$), the results were not significant for the group that participated in training. Only Singapore showed significant results for both Participation in Training moderator groups. When Singaporeans participated in training, the relationship between Workplace Autonomy and ILBs was positive and significant ($B = 0.167, p = 0.032$). This relationship became stronger for those who did not participate ($B = 0.459, p < 0.001$).

[INSERT TABLE 4]

The relationship between Workplace Interaction and ILBs was significantly moderated by Participation in Training in only nine countries: Germany, Canada, Kazakhstan, Chile, Slovakia, Slovenia, Estonia, Israel, and Mexico (Table 5). The simple slopes analysis of the groups of the moderator variable Participation in Training indicated that the results of

the group that participated in training were not significant for Germany (Yes: $B = 0.061, p = 0.322$; No: $B = 0.273, p < 0.001$) and Israel (Yes: $B = 0.032, p = 0.607$; No: $B = 0.403, p < 0.001$). When respondents participated in training, the relationship between Workplace Interaction and ILBs was positive and significant. However, for those who did not participate, this relationship became stronger for Canada (Yes: $B = 0.182, p = 0.002$; No: $B = 0.396, p < 0.001$), Kazakhstan (Yes: $B = 0.353, p < 0.001$; No: $B = 0.531, p < 0.001$), Chile (Yes: $B = 0.246, p < 0.001$; No: $B = 0.476, p < 0.001$), Slovakia (Yes: $B = 0.177, p = 0.001$; No: $B = 0.351, p < 0.001$), Slovenia (Yes: $B = 0.168, p < 0.001$; No: $B = 0.324, p < 0.001$), Estonia (Yes: $B = 0.231, p < 0.001$; No: $B = 0.441, p < 0.001$), and Mexico (Yes: $B = 0.157, p = 0.002$; No: $B = 0.374, p < 0.001$).

[INSERT TABLE 5]

Discussion

We investigated the moderating role of Participation in Training in predicting ILBs based on the 3-P holistic workplace learning model (Tynjälä, 2013). Additionally, analysing sample data with diverse countries, education levels, occupations, and age groups—such as the PIAAC—may provide robust results that facilitate the generalization of findings supporting global policies. However, these findings were not kept for all 34 countries when that prediction of moderation was tested for each. For example, this may be associated with establishing policies to validate informal learning or how organizations and workers value and undertake informal learning processes and activities. Those policy differences were reported between Austria and Italy (Assinger & Biasin, 2023), and these value differences were found between immigrants in Canada and Germany (Annen, 2023). This autochthonous information – on country-level policies and their cultural attributes – is relatively scarce when informal learning is considered. Such a shortage hinders evidence-based interpretations for countries whose findings diverged from those obtained for the aggregated sample and points

out the need to produce this information. However, we expect that our findings will be relevant for future research.

The aggregated results indicated that Participation in Training is positively related to ILBs; training participants showed more ILBs than nonparticipants did. These findings align with others who demonstrated a strong and positive association between training at work and ILBs (Bednall & Sanders, 2017; Khandakar & Pangil, 2019; Naval et al., 2020; Randall et al., 2022). There was less variability in ILBs among the training participants. Thus, the lack of training before data collection, in addition to probably reducing these behaviours, could have increased their variability among respondents. Both results suggest that a formal learning experience can benefit subsequent informal learning. Nevertheless, the positive association between on-the-job training and informal learning varied across countries in the PIAAC data also used by Naval et al. (2020).

Training and ILBs belong to the Process dimension of the 3-P model by Tynjälä (2013). The author does not distinguish the different learning modalities and their respective behaviours. However, we argue that this distinction would allow a more accurate investigation of workplace learning. The results of the correlations indicate that there is effectively a positive association between Participation in Training and ILBs but suggest that they may be different constructs. Furthermore, the tests of differences between means and variances indicate that there may be an advantageous complementarity between Participation in Training and informal workplace learning. However, we went beyond that. We tested whether that participation can alter the prediction of ILBs.

The Participation in Training variable did not moderate the relationship between Readiness to Learn and ILBs in the aggregated sample, but it does in four PIAAC countries. This readiness is a construct whose measure combines items related to motivation to learn and intrinsic reflection. Readiness to Learn corresponds to the learner factors of the Presage

dimension of the 3-P model by Tynjälä (2013). Readiness to Learn may be associated with the workers' personality traits. Openness to experience is positively related to Participation in Training and is the most relevant indicator of the Big Five personality dimensions model (Laible et al., 2020). The findings of these authors also indicated that the type of training and the reason for participation affect the relationship between personality traits and Participation in Training. It is possible that workers with Readiness to Learn informally organize their needs, regardless of whether they had formal opportunities offered in their work environment (Decius et al., 2021).

Dispositional variables linked to personality traits are little subject to situational variables, such as Participation in Training. The impact of workplace learning on innovative behaviour in small and medium-sized companies was investigated by Shah et al. (2022). The results indicated that formal learning did not affect the idea generation dimension of innovative behaviour, but informal learning did. This dimension is a dispositional variable that involves forming new thoughts or ideas valuable for job performance. On the other hand, formal and informal learning positively influence the idea realization dimension of innovative behavior, which is a situational variable of practical implementation of innovations as part of routine performance (Shah et al., 2022). Our results may indicate that a situational variable—Participation in Training—does not strengthen or weaken the association between a dispositional variable and ILBs. It is possible that dispositional variables can be altered only by circumstances other than training because they are performed outside the specific work context and because many of them can be transient. However, these dispositional variables can strengthen the relationships between behaviour and other situational characteristics, especially if these characteristics are more enduring and related to the work context.

Participation in Training moderated the relationship between Workplace Autonomy and ILBs, but this relationship was stronger for the group that did not participate in training.

Other studies have also indicated that training plays a significant role in Workplace Autonomy (Axtell et al., 1997; Hout, 1984; Huczynski & Lewis, 1980; Itzchakov et al., 2023; Vandenput, 1973).

Workplace Autonomy corresponds to the learning context of the Presage dimension of the 3-P model (Tynjälä, 2013). According to this model, this dimension influences the Process dimension, including learning modalities and their respective behaviours. Workplace Autonomy is a situational variable. Variables of this nature are more likely to undergo short-term changes due to other situational variables, such as Participation in Training. However, unlike what was stated in our hypothesis, the relationship between Workplace Autonomy and ILBs was strengthened in the group that did not participate in training. Scarce training opportunities could lead to more autonomy to turn to ILBs to fill this gap. Therefore, when training opportunities arise, they are not perceived as relevant. It is also possible that training has a kind of autonomy-limiting effect. The instructional design of training focuses on promoting desirable competencies for performance. Thus, the abundance of training opportunities may be understood as the need to rigorously follow what was taught, which could nurture individuals to cast off their autonomy.

Participation in Training moderated the relationship between Work Interaction and ILBs. The relationship was stronger for respondents who did not participate in training. Workplace Interaction, like Workplace Autonomy, is a situational variable corresponding to the Presage dimension's learning context (Tynjälä, 2013). Our results agree with those of the 3-P model, which indicates that the Presage dimension influences the Process dimension, where training and ILBs fall.

The results of the moderation analyses for the independent variables Workplace Interaction and Autonomy were similar. The relationship between situational variables and behaviours seems more subject to short-term changes caused by other situational variables

than the relationship between dispositional variables and behaviours (Shah et al., 2022). These elements of job design can likely compensate for the lack of formal learning opportunities and encourage informal workplace learning. As suggested for Workplace Autonomy, Participation in Training could inhibit the potential of another element of job design—workplace interaction. Training may promote the belief that acting strictly by what was learned would be essential and that resorting to other behaviours—such as interacting with colleagues—would not benefit informal learning and job performance.

Practical implications

Participation in Training may increase the workers' display of ILBs. Informal learning is more frequent than formal learning in the workplace, and our results indicate that offering training to workers may also promote an increase in this frequency, which could lead to better performance and greater productivity. Thus, investing in training may produce a high return on investment, mediated by the transfer to work of the specific skills acquired in the training. In addition, it promotes ILBs, which can diversify the development of skills demanded by a workplace. The effect that investment in training may have on workers' perception of the need to demonstrate reciprocity must also be considered. The opportunities to participate in formal learning are related to affective commitment, work involvement, and innovative behaviours. In contrast, opportunities to participate in informal learning activities positively relate to work engagement (Coetzer et al., 2020). When realizing that the organization where they work offers support for their development, workers can increase their engagement in informal learning (Randall et al., 2022).

Investment in training opportunities should be used to promote short- and long-term ILBs since they may be interpreted as those organizations' commitment to everlasting internal careers (Bednall & Sanders, 2017). In line with them, this promotion would be intensified by instructionally designing training materials to advance the use of learned skills

at work and by linking this use and ILBs to performance appraisal. These training and appraisal practices—along with other human resource management (HRM) practices (i.e., selective hiring, compensation practices, time off and reduced overload)—should be used to promote ILBs in organizations (Khandakar & Pangil, 2019; Randall et al., 2022). Workers would be encouraged to share new knowledge and to improve their knowledge-based performance, as they would perceive an HRM system that provides facilities and favours the environment for learning, according to Khandakar and Pangil (2019). HRM professionals should be aware of how their organizations' employees understand this system. ILBs are mainly invisible because these behaviours are taken for granted, or learning is not recognized because of them (Eraut, 2004). Managers could be encouraged to acknowledge ILBs and provide informal support for them (Decius et al., 2021). These behaviours—for instance, feedback-seeking and reflection—could be taught, as suggested by these authors.

A moderating effect of Participation in Training on the relationship between ILBs and Workplace Interaction and Autonomy was observed. However, these relationships with job design variables were stronger for the group that did not participate in training. In the absence of training, workers subjected to a job design that promotes more autonomy and interaction seek to overcome that absence by displaying a more significant amount of ILBs. Therefore, if training is impossible, investment should be made in promoting job design characteristics. Designing workplaces that allow individuals to control their work facilitates trying out (Axtell et al., 1997). Autonomy may benefit from feelings of psychological safety, and these feelings were found to be developed by training programmes that teach skills to listen to work peers fully and attentively (Itzhakov et al., 2023). These authors suggest that using these skills would create more positive group relationships, which may result in motivation and engagement and lessening the fears of speaking and self-expression at the workplace.

Due to the relevance of workplace interaction for ILBs, instructors and/or those responsible for training should consider this variable in the instructional design. Specific training or training that also includes the development of workplace interaction skills may also help promote informal learning. The training results on professional interactions for surgeons in residences indicated a considerable improvement in dealing with complex interactions with colleagues (O'Keeffe et al., 2022). Thus, to maximize learning, staff development programmes should consider the combined options of instructional design to acquire desired skills and job (re)design to promote ILBs.

Limitations, conclusion, and future research

The information was collected using self-reported measures and was cross-sectional. However, we performed a Harman test, which did not indicate common method bias. The measurement of Participation in Training does not guarantee that its instructional design was adequate and, consequently, that it may have promoted the acquisition and subsequent transfer of job skills. Future studies could include evaluations of this design and this acquisition and transfer and obtain information on when participants participated in these training sessions to measure the time interval between their participation and that transfer. They could also include research questions involving ILBs and their association with other motivational and reflection indicators, job design characteristics, country-level policies, and cultural attributes.

Another limitation was the impossibility of controlling the type of training offered and when it occurred. The PIAAC Background Questionnaire does not detail the kind of training; it records only whether the respondent participated in training. Investigating the perceived usefulness of formal learning outcomes for daily work may be more relevant than investigating whether someone participated in training (Elsen et al., 2022). In addition, the PIAAC does not include data on a wide variety of job design characteristics, and it was

impossible to control the occupation of the participants because the vast diversity of the selected sample did not allow the creation of categories with an equivalent number. Future studies could assess whether types of training—instructionally designed for the acquisition of different competencies—moderate the relationship between ILBs and their occupational or dispositional antecedents and antecedents relative to job design characteristics other than Workplace Autonomy and Interaction. These studies could still obtain data on the relevance of training to participants and/or their profession and whether it moderates the relationship between ILBs and their predictors.

The acceleration of changes in the world of work requires workers to be increasingly capable of dealing with transformations and challenges. Thus, workplace learning is a powerful tool for acquiring skills, increasing productivity, and ensuring the competitiveness of organizations. In scenarios of economic recession, resources for investment in training decrease. Thus, given that the informal modality of workplace learning is more frequent than the formal modality, the findings of this study may offer solutions that consider the associations between these learning modalities and their interactions with work characteristics aiming at saving resources, optimizing investments, decreasing feelings of insecurity, and increasing employability. Professionals must consider that those solutions can emerge from combining two design avenues: instructional and job-related.

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Table 1 - Variables, scales, reliability indices, and items extracted from the background questionnaire of the Programme for the International Assessment of Adult Competencies (PIAAC).

Variables	Items
Independent variables	
Workplace Autonomy (3 items, $\alpha = 0.83$) Response scale: “not at all” (1) to “a very high extent” (5)	“To what extent can you choose or change: (D_Q11a) “the sequence of your tasks?”; (D_Q11b) “how you do your work?”; (D_Q11c) “the speed or rate at which you work?”.
Workplace Interaction (6 items, $\alpha = 0.81$) Response scale: “never” (1) to “everyday” (5)	“How often does your job usually involve: (F_Q02b) “instructing, training or teaching people, individually or in groups?”; (F_Q02c) “making speeches or giving presentations in front of five or more people?”; (F_Q02e) “advising people?”; (F_Q03b) “planning the activities of others?”; (F_Q04a) “persuading or influencing people?”; (F_Q04b) “negotiating with people either inside or outside your firm or organization?”.
Readiness to Learn (6 items, $\alpha = 0.86$) Response scale: “not at all” (1) to “a very high extent” (5)	(I_Q04b) “When I hear or read about new ideas, I try to relate them to real life situations to which they might apply”; (I_Q04d) “I like learning new things”; (I_Q04h) “When I come across something new, I try to relate it to what I already know”; (I_Q04j) “I like to get to the bottom of difficult things”; (I_Q04l) “I like to figure out how different ideas fit together”; (I_Q04m) “If I don't understand something, I look for additional information to make it clearer”.
Dependent variable	
Informal learning behaviours (3 items, $\alpha = 0.71$) Response scale: “never” (1) to “everyday” (5)	(D_Q13a) “In your own job, how often do you learn new work-related things from co-workers or supervisors?”; (D_Q13b) “How often does your job involve learning-by-doing from the tasks you perform?”; (D_Q13c) “How often does your job involve keeping up to date with new products or services?”.
Moderating variable	
Participation in training (1 item) Response scale: “Yes” (1) or “No” (2)	(B_Q12c) “During the last 12 months, have you attended any organized sessions for on-the-job training or training by supervisors or co-workers?” Training can involve: 1. This type of training is characterized by planned periods of training, instruction or practical experience, using normal tools of work. 2. It is usually organized by the employer to facilitate adaptation of (new) staff. 3. It may include general training about the company as well as specific job-related instructions (safety and health hazards, working practices). 4. It includes for instance organized training or instructions by management,

supervisors or coworkers to help the respondent to do his/her job better or to introduce him/her to new tasks, but can also take place in the presence of a tutor.

Table 2 - Means, standard deviations and correlations between study variables

	Mean	SD	ILBs	WA	WI	RtL	Group
ILBs	3.33	1.076	-				
WA	3.23	1.097	0.141**	-			
WI	2.70	1.135	0.368**	0.314**	-		
RtL	3.73	0.732	0.307**	0.224**	0.331**	-	
Group	1.50	0.500	0.194**	0.069**	0.244**	0.155**	-

Abbreviations: Group, participation in training; ILBs, Informal Learning Behaviours; RtL,

Readiness to Learn; WA, Workplace Autonomy; WI, Workplace Interaction.

** $p < 0.001$.

Table 3 - Moderation analysis (independent variable: Readiness to Learn)

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI		
						LB	UB	
Kazakhstan	RtL	0.364	0.058	6.31	0.000*	0.251	0.476	
	B_Q12c	-0.511	0.099	-5.14	0.000*	-0.706	-0.317	
	RtL*B_Q12c	0.283	0.117	2.42	0.016*	0.054	0.513	
	Conditional effects (W)							
	Yes	0.222	0.091	2.44	0.015*	0.044	0.400	
	No	0.505	0.073	6.88	0.000*	0.361	0.649	
Slovenia	RtL	0.307	0.065	4.72	0.000*	0.179	0.434	
	B_Q12c	-0.280	0.083	-3.36	0.000*	-0.444	-0.117	
	RtL*B_Q12c	-0.350	0.133	-2.62	0.009*	-0.611	-0.089	
	Conditional effects (W)							
	Yes	0.482	0.095	5.07	0.000*	0.296	0.668	
	No	0.132	0.092	1.43	0.152	-0.049	0.313	
Poland	RtL	0.464	0.071	6.54	0.000*	0.325	0.603	
	B_Q12c	-0.250	0.091	-2.75	0.006*	-0.429	-0.072	
	RtL*B_Q12c	-0.328	0.144	-2.27	0.023*	-0.611	-0.045	
	Conditional effects (W)							
	Yes	0.628	0.109	5.78	0.000*	0.415	0.841	
	No	0.300	0.094	3.20	0.001*	0.116	0.484	
Singapore	RtL	0.482	0.061	7.92	0.000*	0.363	0.602	
	B_Q12c	-0.238	0.089	-2.68	0.007*	-0.413	-0.064	
	RtL*B_Q12c	0.372	0.126	2.95	0.003*	0.125	0.619	
	Conditional effects (W)							
	Yes	0.296	0.095	3.11	0.002*	0.110	0.483	
	No	0.668	0.081	8.29	0.000*	0.510	0.826	

Note: B_Q12c, Participation in Training; RtL, Readiness to Learn.

* $p < 0.05$.

Table 4 - Moderation analysis (independent variable: Workplace Autonomy)

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI		
						LB	UB	
Germany	WA	-0.026	0.047	-0.557	0.578	-0.116	0.067	
	B_Q12c	-0.423	0.082	-5.145	0.000*	-0.595	-0.265	
	WA*B_Q12c	0.226	0.089	2.548	0.011*	0.041	0.396	
	Conditional effects (W)							
	Yes	-0.139	0.062	-2.246	0.025*	-0.258	-0.019	
	No	0.087	0.067	1.304	0.192	-0.043	0.222	
Cyprus	WA	0.099	0.043	2.31	0.021*	0.015	0.183	
	B_Q12c	-0.506	0.090	-5.59	0.000*	0.015	0.183	
	WA*B_Q12c	0.192	0.086	2.24	0.025*	0.024	0.360	
	Conditional effects (W)							
	Yes	0.003	0.066	0.045	0.964	-0.127	0.133	
	No	0.195	0.055	3.540	0.000*	0.087	0.303	
Netherlands	WA	0.175	0.043	4.02	0.000*	0.090	0.261	
	B_Q12c	-0.327	0.087	-3.77	0.000*	-0.498	-0.157	
	WA*B_Q12c	0.238	0.087	2.73	0.006*	0.067	0.409	
	Conditional effects (W)							
	Yes	0.056	0.067	0.846	0.398	-0.074	0.187	
	No	0.294	0.057	5.153	0.000*	0.182	0.406	
New Zealand	WA	0.140	0.041	3.44	0.000*	0.060	0.220	
	B_Q12c	-0.418	0.081	-5.14	0.000*	-0.577	-0.258	
	WA*B_Q12c	0.161	0.082	1.97	0.049*	8.75e-4	0.320	
	Conditional effects (W)							
	Yes	0.060	0.058	1.04	0.299	-0.053	0.173	
	No	0.221	0.058	3.81	0.000*	0.107	0.334	
Singapore	WA	0.313	0.053	5.92	0.000*	0.209	0.417	
	B_Q12c	-0.355	0.092	-3.88	0.000*	-0.535	-0.176	
	WA*B_Q12c	0.291	0.107	2.73	0.006*	0.082	0.500	
	Conditional effects (W)							
	Yes	0.167	0.078	2.14	0.032*	0.014	0.321	
	No	0.459	0.073	6.31	0.000*	0.316	0.601	

Note: B_Q12c, Participation in Training; WA, Workplace Autonomy.

* $p < 0.05$.

Table 5 - Moderation analysis (independent variable: Workplace Interaction)

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI		
						LB	UB	
Germany	WI	0.167	0.043	3.87	0.000*	0.084	0.257	
	B_Q12c	-0.320	0.081	-3.95	0.000*	-0.485	-0.160	
	WI*B_Q12c	0.213	0.087	2.45	0.014*	0.052	0.385	
	Conditional effects (W)							
	Yes	0.061	0.061	0.991	0.322	-0.053	0.187	
	No	0.273	0.062	4.441	0.000*	0.155	0.403	
Canada	WI	0.289	0.039	7.34	0.000*	0.212	0.366	
	B_Q12c	-0.264	0.086	-3.06	0.002*	-0.433	-0.095	
	WI*B_Q12c	0.213	0.080	2.66	0.008*	0.056	0.371	
	Conditional effects (W)							
	Yes	0.182	0.059	3.08	0.002*	0.066	0.298	
	No	0.396	0.054	7.37	0.000*	0.290	0.501	
Kazakhstan	WI	0.442	0.042	10.49	0.000*	0.360	0.525	
	B_Q12c	-0.380	0.095	-4.00	0.000*	-0.566	-0.194	
	WI*B_Q12c	0.178	0.087	2.04	0.041*	0.007	0.349	
	Conditional effects (W)							
	Yes	0.353	0.060	5.91	0.000*	0.236	0.470	
	No	0.531	0.062	8.58	0.000*	0.410	0.653	
Chile	WI	0.361	0.039	9.37	0.000*	0.286	0.437	
	B_Q12c	-0.112	0.089	-1.25	0.210	-0.286	0.063	
	WI*B_Q12c	0.230	0.080	2.87	0.004*	0.073	0.388	
	Conditional effects (W)							
	Yes	0.246	0.058	4.24	0.000*	0.132	0.360	
	No	0.476	0.054	8.84	0.000*	0.371	0.582	
Slovakia	WI	0.264	0.040	6.70	0.000*	0.187	0.342	
	B_Q12c	-0.155	0.093	-1.66	0.097	-0.338	0.028	
	WI*B_Q12c	0.174	0.081	2.15	0.032*	0.015	0.332	
	Conditional effects (W)							
	Yes	0.177	0.056	3.18	0.001*	0.068	0.287	
	No	0.351	0.058	6.11	0.000*	0.238	0.464	
Slovenia	WI	0.246	0.034	7.27	0.000*	0.180	0.313	
	B_Q12c	-0.259	0.081	-3.20	0.001*	-0.418	-0.101	
	WI*B_Q12c	0.155	0.069	2.26	0.024*	0.021	0.290	
	Conditional effects (W)							
	Yes	0.168	0.051	3.34	0.000*	0.070	0.267	
	No	0.324	0.046	6.99	0.000*	0.233	0.415	
Estonia	WI	0.336	0.036	9.42	0.000*	0.266	0.406	

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
	B_Q12c	-0.168	0.081	-2.06	0.039*	-0.328	-0.008
	WI*B_Q12c	0.209	0.076	2.78	0.006*	0.062	0.357
	Conditional effects (W)						
	Yes	0.231	0.053	4.39	0.000*	0.128	0.335
	No	0.441	0.052	8.53	0.000*	0.340	0.542
Israel	WI	0.218	0.040	5.50	0.000*	0.140	0.295
	B_Q12c	-0.418	0.089	-4.72	0.000*	-0.591	-0.244
	WI*B_Q12c	0.372	0.082	4.54	0.000*	0.211	0.532
	Conditional effects (W)						
	Yes	0.032	0.062	0.514	0.607	-0.090	0.153
	No	0.403	0.053	7.568	0.000*	0.299	0.508
Mexico	WI	0.266	0.036	7.29	0.000*	0.195	0.337
	B_Q12c	-0.407	0.089	-4.59	0.000*	-0.581	-0.234
	WI*B_Q12c	0.217	0.077	2.83	0.005*	0.067	0.368
	Conditional effects (W)						
	Yes	0.157	0.052	3.05	0.002*	0.056	0.259
	No	0.374	0.055	6.83	0.000*	0.267	0.482

Note: B_Q12c, Participation in Training; WI, Workplace Interaction.

* $p < 0.05$.

Figure 1 - Effect of participation in training on the relationship between Workplace Autonomy and Informal Learning Behaviors (ILBs)

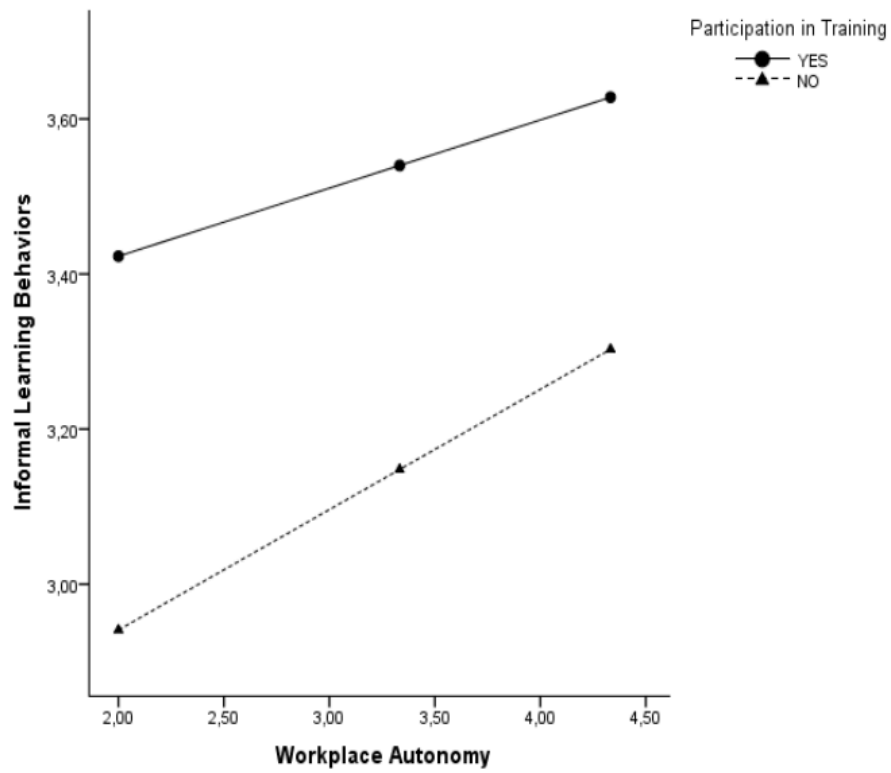
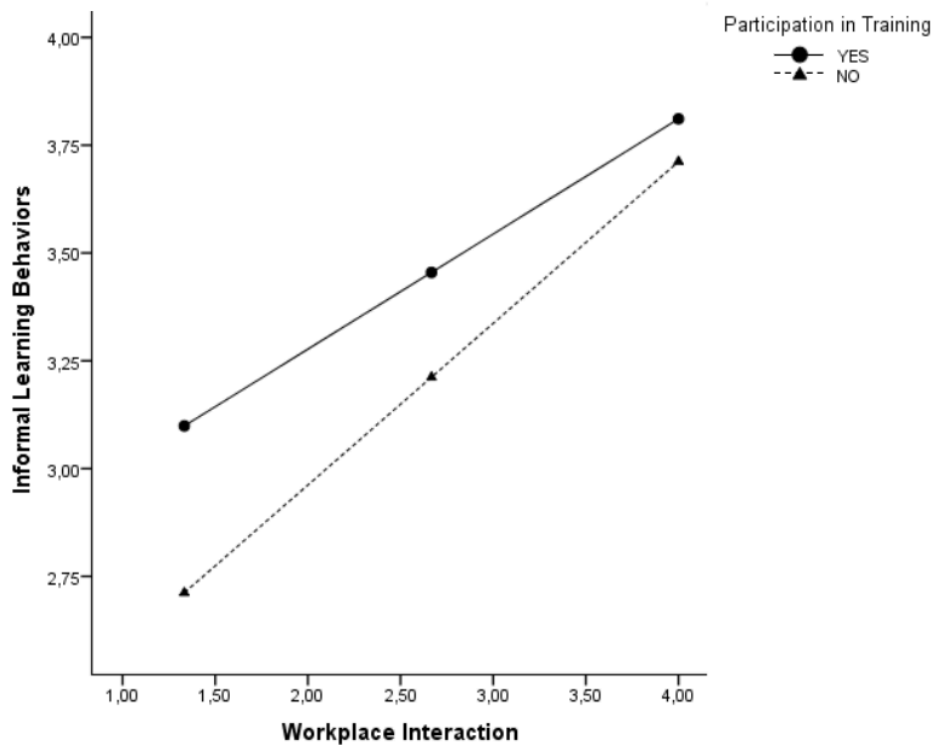


Figure 2 - Effect of participation in training on the relationship between Workplace Interaction and Informal Learning Behaviors (ILBs)



Annex

Table 6 - Nonsignificant moderation analyses

Country		<i>B</i>	SE	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
Independent Variable: Workplace Autonomy							
Austria	WA	0.109	0.041	2.649	0.008*	0.028	0.190
	B_Q12c	-0.520	0.079	-6.611	0.000*	-0.675	-0.366
	WA*B_Q12c	-0.051	0.083	-0.614	0.539	-0.212	0.111
Belgium	WA	0.144	0.042	3.392	0.000*	0.061	0.227
	B_Q12c	-0.281	0.084	-3.370	0.000*	-0.445	-0.118
	WA*B_Q12c	0.033	0.086	0.385	0.700	-0.136	0.202
Canada	WA	0.071	0.046	1.53	0.125	-0.020	0.162
	B_Q12c	-0.382	0.091	-4.19	0.000*	-0.561	-0.204
	WA*B_Q12c	0.103	0.093	1.11	0.266	-0.079	0.284
Kazakhstan	WA	0.222	0.042	5.254	0.000*	0.139	0.305
	B_Q12c	-0.579	0.102	-5.700	0.000*	-0.778	-0.379
	WA*B_Q12c	0.058	0.085	0.686	0.493	-0.108	0.225
Chile	WA	0.120	0.045	2.666	0.008*	0.032	0.209
	B_Q12c	-0.338	0.096	-3.505	0.000*	-0.527	-0.149
	WA*B_Q12c	-0.010	0.090	-0.116	0.908	-0.187	0.166
South Korea	WA	0.100	0.041	2.471	0.013	0.021	0.180
	B_Q12c	-4.414	0.091	-4.561	0.000*	-0.592	-0.236
	WA*B_Q12c	-0.005	0.082	-0.057	0.955	-0.165	0.156
Ecuador	WA	0.207	0.042	4.99	0.000*	0.126	0.288
	B_Q12c	-0.553	0.105	-5.29	0.000*	-0.758	-0.348
	WA*B_Q12c	0.108	0.083	1.30	0.195	-0.055	0.271
Slovakia	WA	0.102	0.043	2.385	0.017*	0.018	0.185
	B_Q12c	-0.269	0.097	-2.771	0.006*	-0.459	-0.079
	WA*B_Q12c	0.083	0.086	0.966	0.334	-0.085	0.251
Slovenia	WA	0.121	0.042	2.908	0.004*	0.039	0.202
	B_Q12c	-0.354	0.085	-4.172	0.000*	-0.520	-0.188
	WA*B_Q12c	0.036	0.083	0.434	0.664	-0.127	0.199
Spain	WA	0.054	0.0469	1.151	0.250	-0.038	0.146
	B_Q12c	-0.459	0.104	-4.421	0.000*	-0.662	-0.255
	WA*B_Q12c	-0.069	0.094	-0.378	0.461	-0.253	0.115

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
Estonia	WA	0.191	0.049	3.894	0.000*	0.095	0.286
	B_Q12c	-0.396	0.087	-4.557	0.000*	-0.566	-0.226
	WA*B_Q12c	0.058	0.098	0.593	0.553	-0.134	0.250
USA	WA	0.022	0.047	0.462	0.644	-0.071	0.115
	B_Q12c	-0.425	0.090	-4.739	0.000*	-0.600	-0.249
	WA*B_Q12c	-0.084	0.095	-0.888	0.375	-0.271	0.102
Finland	WA	0.012	0.045	0.258	0.796	-0.077	0.100
	B_Q12c	-0.211	0.073	-2.883	0.004*	-0.355	-0.068
	WA*B_Q12c	-0.106	0.090	-1.172	0.241	-0.283	0.071
France	WA	0.163	0.042	3.93	0.000*	0.082	0.244
	B_Q12c	-0.378	0.092	-4.13	0.000*	-0.558	-0.199
	WA*B_Q12c	0.088	0.083	1.05	0.292	-0.076	0.251
Greece	WA	0.138	0.040	3.50	0.000*	0.061	0.216
	B_Q12c	-0.542	0.089	-6.07	0.000*	-0.717	-0.367
	WA*B_Q12c	0.141	0.081	1.75	0.080	-0.017	0.300
Hungary	WA	-0.030	0.039	-0.755	0.450	-0.107	0.048
	B_Q12c	-0.518	0.090	-5.727	0.000*	-0.695	-0.340
	WA*B_Q12c	0.089	0.079	1.123	0.261	-0.066	0.244
Ireland	WA	0.135	0.047	2.901	0.004*	0.044	0.227
	B_Q12c	-0.261	0.095	-2.758	0.006*	-0.446	-0.075
	WA*B_Q12c	-0.076	0.093	-0.813	0.416	-0.259	0.107
Israel	WA	0.045	0.043	1.05	0.292	-0.039	0.129
	B_Q12c	-0.532	0.093	-5.71	0.000*	-0.714	-0.349
	WA*B_Q12c	0.150	0.086	1.75	0.081	-0.018	0.319
Italy	WA	0.129	0.039	3.291	0.000*	0.052	0.206
	B_Q12c	-0.244	0.088	-2.781	0.005*	-0.417	-0.072
	WA*B_Q12c	-0.034	0.079	-0.436	0.663	-0.188	0.120
Lithuania	WA	0.075	0.031	2.404	0.016*	0.0139	0.1363
	B_Q12c	-0.270	0.082	-3.308	0.000*	-0.430	-0.110
	WA*B_Q12c	-0.047	0.064	-0.730	0.466	-0.172	0.079
Mexico	WA	0.185	0.042	4.413	0.000*	0.103	0.268
	B_Q12c	-0.559	0.091	-6.122	0.000*	-0.738	-0.380
	WA*B_Q12c	0.071	0.085	0.838	0.402	-0.095	0.237
Norway	WA	0.043	0.040	1.060	0.289	-0.036	0.122
	B_Q12c	-0.204	0.068	-3.000	0.003*	-0.337	-0.071

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						<i>LB</i>	<i>UB</i>
	WA*B_Q12c	-0.012	0.081	-0.148	0.883	-0.170	0.146
Peru	WA	0.164	0.046	3.54	0.000*	0.073	0.255
	B_Q12c	-0.425	0.093	-4.59	0.000*	-0.607	-0.244
	WA*B_Q12c	0.110	0.093	1.18	0.236	-0.072	0.292
Poland	WA	0.079	0.046	1.710	0.087	-0.012	0.170
	B_Q12c	-0.342 1	0.095	-3.618	0.000*	-0.527	-0.157
	WA*B_Q12c	-0.025	0.093	-0.270	0.787	-0.208	0.158
United Kingdom	WA	0.202	0.043	4.656	0.000*	0.117	0.287
	B_Q12c	-0.277	0.093	-2.982	0.003*	-0.459	-0.095
	WA*B_Q12c	-0.037	0.087	-0.430	0.667	-0.207	0.133
Czech republic	WA	0.052	0.042	1.24	0.214	-0.030	0.133
	B_Q12c	-0.274	0.089	-3.08	0.002*	-0.448	-0.099
	WA*B_Q12c	0.088	0.083	1.06	0.290	-0.075	0.250
Russia	WA	0.214	0.046	4.66	0.000*	0.124	0.304
	B_Q12c	-0.575	0.093	-6.15	0.000*	-0.758	-0.391
	WA*B_Q12c	-0.105	0.093	-1.12	0.261	-0.287	0.078
Sweden	WA	0.142	0.044	3.198	0.001*	0.055	0.229
	B_Q12c	-0.267	0.075	-3.538	0.000*	-0.414	-0.119
	WA*B_Q12c	0.065	0.089	0.734	0.463	-0.109	0.239
Turkey	WA	0.149	0.043	3.458	0.000*	0.064	0.233
	B_Q12c	-0.651	0.094	-6.937	0.000*	-0.835	-0.467
	WA*B_Q12c	0.061	0.086	0.714	0.475	-0.107	0.230
Independent Variable: Workplace Interaction							
Austria	WI	0.285	0.035	8.195	0.000*	0.217	0.353
	B_Q12c	-0.367	0.075	-4.916	0.000*	-0.514	-0.221
	WI*B_Q12c	0.023	0.072	0.322	0.747	-0.118	0.164
Belgium	WI	0.276	0.036	7.59	0.000*	0.205	0.347
	B_Q12c	-0.156	0.080	-1.95	0.051	-0.313	9.27e-4
	WI*B_Q12c	0.104	0.076	1.36	0.172	-0.045	0.252
Cyprus	WI	0.295	0.040	7.38	0.000*	0.217	0.373
	B_Q12c	-0.373	0.087	-4.30	0.000*	-0.543	-0.203
	WI*B_Q12c	0.139	0.082	1.70	0.090	-0.022	0.300
South Korea	WI	0.352	0.038	9.16	0.000*	0.276	0.427
	B_Q12c	-0.194	0.085	-2.28	0.023*	-0.360	-0.027

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
	WI*B_Q12c	0.095	0.081	1.17	0.241	-0.064	0.254
Ecuador	WI	0.328	0.041	7.99	0.000*	0.248	0.408
	B_Q12c	-0.377	0.101	-3.73	0.000*	-0.575	-0.179
	WI*B_Q12c	0.165	0.085	1.93	0.053	-0.002	0.332
Spain	WI	0.403	0.041	9.82	0.000*	0.322	0.483
	B_Q12c	-0.222	0.096	-2.33	0.020*	-0.410	-0.035
	WI*B_Q12c	0.088	0.085	1.04	0.300	-0.078	0.254
USA	WI	0.295	0.038	7.733	0.000*	0.220	0.369
	B_Q12c	-0.268	0.085	-3.147	0.002*	-0.434	-0.101
	WI*B_Q12c	-0.030	0.078	-0.379	0.705	-0.183	0.124
Finland	WI	0.186	0.034	5.476	0.000*	0.119	0.252
	B_Q12c	-0.121	0.071	-1.693	0.090	-0.261	0.019
	WI*B_Q12c	-0.048	0.070	-0.684	0.494	-0.184	0.089
France	WI	0.382	0.038	10.02	0.000*	0.307	0.456
	B_Q12c	-0.236	0.085	-2.79	0.005*	-0.403	-0.070
	WI*B_Q12c	0.114	0.078	1.47	0.142	-0.038	0.267
Greece	WI	0.282	0.040	7.10	0.000*	0.204	0.359
	B_Q12c	-0.362	0.087	-4.17	0.000*	-0.532	-0.192
	WI*B_Q12c	0.129	0.087	1.50	0.135	-0.040	0.299
Netherlands	WI	0.383	0.037	10.397	0.000*	0.310	0.455
	B_Q12c	-0.206	0.081	-2.541	0.011*	-0.365	-0.047
	WI*B_Q12c	0.003	0.075	0.042	0.967	-0.143	0.149
Hungary	WI	0.262	0.044	5.95	0.000*	0.176	0.348
	B_Q12c	-0.389	0.088	-4.44	0.000*	-0.560	-0.217
	WI*B_Q12c	0.152	0.090	1.68	0.092	-0.025	0.329
Ireland	WI	0.378	0.039	9.694	0.000*	0.302	0.455
	B_Q12c	-0.092	0.088	-1.049	0.294	-0.264	0.080
	WI*B_Q12c	0.006	0.080	0.069	0.945	-0.150	0.161
Italy	WI	0.268	0.041	6.583	0.000*	0.188	0.348
	B_Q12c	-0.162	0.085	-1.894	0.058	-0.329	0.006
	WI*B_Q12c	0.004	0.083	0.046	0.963	-0.159	0.167
Lithuania	WI	0.258	0.039	6.715	0.000*	0.183	0.334
	B_Q12c	-0.079	0.079	-0.991	0.322	-0.234	0.077
	WI*B_Q12c	0.090	0.086	1.052	0.293	-0.078	0.258
	WI	0.230	0.034	6.77	0.000*	0.164	0.297

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						<i>LB</i>	<i>UB</i>
Norway	B_Q12c	-0.159	0.065	-2.44	0.015*	-0.286	-0.031
	WI*B_Q12c	0.088	0.068	1.29	0.197	-0.046	0.222
New Zealand	WI	0.290	0.035	8.280	0.000*	0.222	0.359
	B_Q12c	-0.266	0.078	-3.431	0.000*	-0.418	-0.114
	WI*B_Q12c	0.058	0.072	0.802	0.422	-0.083	0.199
Peru	WI	0.359	0.039	9.278	0.000*	0.283	0.434
	B_Q12c	-0.269	0.087	-3.091	0.002*	-0.440	-0.099
	WI*B_Q12c	0.065	0.079	0.823	0.411	-0.090	0.221
Poland	WI	0.250	0.043	5.701	0.000*	0.162	0.332
	B_Q12c	-0.213	0.092	-2.318	0.020*	-0.393	-0.033
	WI*B_Q12c	-0.074 5	0.090	-0.825	0.409	-0.252	0.103
United Kingdom	WI	0.405	0.038	10.55	0.000*	0.329	0.480
	B_Q12c	-0.120	0.086	-1.39	0.165	-0.288	0.049
	WI*B_Q12c	0.093	0.078	1.19	0.232	-0.060	0.246
Czech republic	WI	0.292	0.041	7.127	0.000*	0.211	0.372
	B_Q12c	-0.131	0.085	-1.531	0.126	-0.298	0.037
	WI*B_Q12c	-0.052	0.084	-0.618	0.536	-0.217	0.113
Russia	WI	0.395	0.040	9.91	0.000*	0.317	0.473
	B_Q12c	-0.336	0.088	-3.81	0.000*	-0.508	-0.163
	WI*B_Q12c	0.167	0.085	1.95	0.051	-9.13e-4	0.334
Singapore	WI	0.361	0.038	9.40	0.000*	0.286	0.436
	B_Q12c	-0.203	0.088	-2.31	0.021*	-0.375	-0.031
	WI*B_Q12c	0.140	0.080	1.76	0.079	-0.016	0.300
Sweden	WI	0.390	0.034	11.50	0.001*	0.323	0.455
	B_Q12c	-0.139	0.068	-2.04	0.041*	-0.271	-0.006
	WI*B_Q12c	0.071	0.069	1.04	0.299	-0.063	0.206
Turkey	WI	0.388	0.038	10.099	0.000*	0.313	0.463
	B_Q12c	-0.424	0.087	-4.867	0.000*	-0.595	-0.253
	WI*B_Q12c	-0.019	0.080	-0.244	0.807	-0.176	0.137
Independent Variable: Readiness to Learn							
Germany	RtL	0.343	0.070	4.901	0.000*	0.206	0.480
	B_Q12c	-0.356	0.080	-4.462	0.000*	-0.512	-0.199
	RtL*B_Q12c	0.084	0.142	0.589	0.556	-0.194	0.361
	RtL	0.268	0.063	4.29	0.000*	0.146	0.391

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						<i>LB</i>	<i>UB</i>
Austria	B_Q12c	-0.474	0.077	-6.12	0.000*	-0.626	-0.322
	RtL*B_Q12c	0.243	0.126	1.93	0.054	-0.004	0.491
Belgium	RtL	0.424	0.058	7.382	0.000*	0.312	0.537
	B_Q12c	-0.261	0.080	-3.246	0.001*	-0.418	-0.103
	RtL*B_Q12c	-0.015	0.116	-0.127	0.899	-0.242	0.212
Canada	RtL	0.375	0.067	5.58	0.000*	0.243	0.506
	B_Q12c	-0.312	0.089	-3.53	0.000*	-0.486	-0.139
	RtL*B_Q12c	0.190	0.136	1.40	0.162	-0.076	0.456
Chile	RtL	0.409	0.070	5.87	0.000*	0.273	0.546
	B_Q12c	-0.250	0.093	-2.68	0.007*	-0.433	-0.067
	RtL*B_Q12c	0.257	0.142	1.81	0.070	-0.021	0.534
Cyprus	RtL	0.396	0.065	6.124	0.000*	0.269	0.523
	B_Q12c	-0.449	0.088	-5.082	0.000*	-0.622	-0.276
	RtL*B_Q12c	0.098	0.131	0.750	0.453	-0.158	0.354
South Korea	RtL	0.366	0.050	7.37	0.000*	0.269	0.463
	B_Q12c	-0.328	0.087	-3.78	0.000*	-0.498	-0.158
	RtL*B_Q12c	0.116	0.101	1.15	0.250	-0.082	0.314
Ecuador	RtL	0.510	0.060	8.45	0.000*	0.391	0.628
	B_Q12c	-0.446	0.100	-4.46	0.000*	-0.642	-0.250
	RtL*B_Q12c	0.213	0.123	1.74	0.081	-0.027	0.454
Slovakia	RtL	0.468	0.060	7.857	0.000*	0.351	0.584
	B_Q12c	-0.187	0.092	-2.029	0.042*	-0.367	-0.006
	RtL*B_Q12c	-0.018	0.120	-0.150	0.881	-0.254	0.218
Spain	RtL	0.325	0.081	4.04	0.000*	0.167	0.483
	B_Q12c	-0.459	0.102	-4.50	0.000*	-0.659	-0.259
	RtL*B_Q12c	0.201	0.161	1.25	0.211	-0.114	0.517
Estonia	RtL	0.502	0.062	8.108	0.000*	0.381	0.624
	B_Q12c	-0.293	0.083	-3.523	0.000*	-0.456	-0.130
	RtL*B_Q12c	0.019	0.126	0.147	0.883	-0.229	0.266
USA	RtL	0.376	0.064	5.929	0.000*	0.252	0.501
	B_Q12c	-0.352	0.087	-4.056	0.000*	-0.521	-0.182
	RtL*B_Q12c	-0.006	0.128	-0.046	0.963	-0.257	0.245
Finland	RtL	0.340	0.069	4.93	0.000*	0.205	0.475
	B_Q12c	-0.169	0.072	-2.36	0.018*	-0.309	-0.029
	RtL*B_Q12c	-0.195	0.139	-1.40	0.161	-0.467	0.078

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
France	RtL	0.597	0.075	7.95	0.000*	0.450	0.744
	B_Q12c	-0.332	0.087	-3.81	0.000*	-0.503	-0.161
	RtL*B_Q12c	0.284	0.151	1.88	0.061	-0.013	0.580
Greece	RtL	0.358	0.066	5.440	0.000*	0.229	0.487
	B_Q12c	-0.504	0.088	-5.727	0.000*	-0.676	-0.331
	RtL*B_Q12c	0.119	0.135	0.883	0.377	-0.145	0.383
Netherlands	RtL	0.411	0.058	7.139	0.000*	0.299	0.525
	B_Q12c	-0.237	0.085	-2.787	0.005*	-0.404	-0.070
	RtL*B_Q12c	-0.103	0.117	-0.879	0.380	-0.332	0.126
Hungary	RtL	0.227	0.059	3.84	0.000*	0.111	0.342
	B_Q12c	-0.458	0.089	-5.13	0.000*	-0.633	-0.283
	RtL*B_Q12c	-0.131	0.119	-1.09	0.274	-0.364	0.103
Ireland	RtL	0.403	0.072	5.586	0.000*	0.262	0.544
	B_Q12c	-0.233	0.093	-2.523	0.012*	-0.415	-0.052
	RtL*B_Q12c	0.018	0.144	0.127	0.899	-0.265	0.301
Israel	RtL	0.351	0.058	6.036	0.000*	0.237	0.465
	B_Q12c	-0.422	0.090	-4.670	0.000*	-0.599	-0.245
	RtL*B_Q12c	0.020	0.119	0.171	0.864	-0.213	0.254
Italy	RtL	0.337	0.068	4.969	0.000*	0.204	0.469
	B_Q12c	-0.225	0.087	-2.601	0.009*	-0.395	-0.056
	RtL*B_Q12c	0.094	0.136	0.689	0.491	-0.173	0.361
Lithuania	RtL	0.225	0.044	5.137	0.000*	0.139	0.312
	B_Q12c	-0.169	0.080	-2.099	0.036*	-0.326	-0.011
	RtL*B_Q12c	-0.004	0.094	-0.044	0.965	-0.188	0.179
Mexico	RtL	0.337	0.064	5.295	0.000*	0.212	0.462
	B_Q12c	-0.519	0.091	-5.731	0.000*	-0.697	-0.342
	RtL*B_Q12c	0.055	0.130	0.427	0.669	-0.199	0.309
Norway	RtL	0.330	0.061	5.44	0.000*	0.211	0.449
	B_Q12c	-0.198	0.066	-3.01	0.003*	-0.327	-0.069
	RtL*B_Q12c	-0.238	0.121	-1.96	0.050	-0.475	1.46e-0
New Zealand	RtL	0.230	0.061	3.793	0.000*	0.111	0.349
	B_Q12c	-0.380	0.081	-4.663	0.000*	-0.539	-0.220
	RtL*B_Q12c	0.061	0.122	0.503	0.615	-0.177	0.300
Peru	RtL	0.433	0.071	6.142	0.000*	0.295	0.572
	B_Q12c	-0.320	0.091	-3.524	0.000*	-0.498	-0.142

Country		<i>B</i>	<i>SE</i>	<i>Z</i>	<i>p</i>	95% CI	
						LB	UB
	RtL*B_Q12c	-0.049	0.145	-0.336	0.737	-0.333	0.235
United Kingdom	RtL	0.484	0.066	7.33	0.000*	0.354	0.613
	B_Q12c	-0.193	0.090	-2.13	0.033*	-0.370	-0.016
	RtL*B_Q12c	-0.203	0.133	-1.52	0.127	-0.464	0.058
Czech republic	RtL	0.139	0.064	2.171	0.030*	0.014	0.265
	B_Q12c	-0.257	0.089	-2.888	0.004*	-0.431	-0.083
	RtL*B_Q12c	-0.082	0.129	-0.632	0.527	-0.334	0.171
Russia	RtL	0.364	0.060	6.08	0.000*	0.247	0.428
	B_Q12c	-0.551	0.092	-6.00	0.000*	-0.731	-0.371
	RtL*B_Q12c	0.190	0.122	1.56	0.118	-0.048	0.429
Sweden	RtL	0.360	0.062	5.772	0.000*	0.238	0.482
	B_Q12c	-0.208	0.074	-2.809	0.005*	-0.352	-0.063
	RtL*B_Q12c	-0.028	0.126	-0.226	0.821	-0.275	0.218
Turkey	RtL	0.457	0.061	7.454	0.000*	0.337	0.578
	B_Q12c	-0.468	0.090	-5.176	0.000*	-0.645	-0.291
	RtL*B_Q12c	-0.085	0.128	-0.663	0.507	-0.335	0.165

Note: WA, Workplace Autonomy; WI, Workplace Interaction; RtL, Readiness to Learn;

B_Q12c, Participation in training.

* $p < 0.05$.

The Impact of National Culture in Predicting Informal Learning Behaviors

Abstract

Purpose – We investigated the impact of Hofstede's six national cultural dimensions on Informal Learning Behaviors (ILBs) and how they moderate the prediction of these behaviors by Workplace Interaction (WI), Autonomy (WA), and Readiness to Learn (RtL).

Design/methodology/approach – Cultural scores were extracted from The Culture Factor Group in 2023. Data on ILBs and their antecedents were selected from a PIAAC sample of 59,103 workers - 33 Countries. We applied Hierarchical Linear Modeling (HLM) to analyze data.

Findings – None of those cultural dimensions had significant direct relationships with ILBs. The moderations were significant for Power Distance (ILBs with WA and RtL), Individualism (ILBs with WI), and Motivation Towards Achievement and Success (ILBs with WA).

Research limitations/implications – The cultural dimensions were limited to Hofstede's model, and scores at the country level did not consider individual perceptions of them. Our results provide empirical evidence for solid theoretical development on the impact of national culture on informal learning and the development of public policies to promote it.

Originality/value – We are unaware of other studies that have quantitatively investigated relationships between ILBs and their antecedents and the cultural dimensions using HLM. Findings from different countries allow for better generalization and may provide directions for research and the expansion of the nomological network on the impact of national culture on ILBs.

Keywords: Informal Learning Behaviors, National Culture, Workplace Interaction and Autonomy, Readiness to Learn

Paper type Research paper

Introduction

The attributes of national cultures may influence behaviors in the workplace. For example, these cultures can facilitate or promote different social relationships, communication, and leadership styles within an organization (Hofstede *et al.*, 2010). When people must learn to face challenges or remove obstacles in their teams or jobs, they should consider these singular relationships (Poell *et al.*, 2009). In the latter part of the 20th century, there was an increase in international joint ventures and outsourcing (Taras *et al.*, 2011). Thus, investors needed to consider differences in national cultures to ensure business effectiveness. Currently, the business world is significantly globalized. However, cultural differences would still impact specific organizational results, such as commitment, identification, citizenship behavior, team-related attitudes, and feedback seeking (Taras *et al.*, 2010). Those differences are strongly related to emotions and impact attitudes, behaviors, and job performance. Therefore, national culture may also affect workplace learning.

Learning has increasingly been used as a tool for adapting to a constantly changing world of work (Park and Choi, 2016). The workers' formal education and skills can quickly become obsolete with this constant change. Their level of education and skills is crucial to the effectiveness and competitiveness of organizations (Illeris, 2009). According to the 70-20-10 workplace learning model, people learn effectively through 70% experiential, 20% social, and 10% formal learning. These percentages may vary depending on the situation and the individual. Notwithstanding, this model should not be universally adopted, as it lacks empirical evidence to corroborate the division of workplace learning, has inconsistent definitions, and practically nullifies the relevance of formal learning (Clardy, 2018). Even so, depending on the context, informal workplace learning may be more relevant for productivity and performance (Clardy, 2018; Tynjälä, 2008). This may be because financial and time resources are not always available to resort to formal learning or training. Informal learning

can enable workers to overcome unforeseen challenges and perform effectively. Informal learning does not always take place regardless. Despite its supposed availability in the workplace, informal learning requires specific antecedents to occur (Cerasoli *et al.*, 2018; Jeong *et al.*, 2018). Additionally, countries may vary in how policies are established to value this type of learning (Annen, 2023) and promote it (Assinger and Biasin, 2023).

Informal learning is affected by numerous antecedents, although national culture should not be disregarded (Millington, 2012). Informal learning can be encouraged in certain countries and frowned upon in others. Furthermore, national culture may influence the relationships between informal learning and its antecedents. The challenge is to know when an organization must consider the influences of national culture to support informal learning to increase productivity and effectiveness (Millington, 2012). Knowing about these cultural influences is not just an academic exercise. This knowledge may support the design and implementation of business practices, ensuring an instructional design tailored to different cultures' specific needs and customs and enhancing the effectiveness and impact of those practices. It can also provide valuable information for immigrant workers. These workers may understand the best practices concerning workplace learning and increase their chances of qualification and employability.

Does national culture influence informal learning? The real impact of national culture on informal learning is still unknown, and further studies are needed (Cerasoli *et al.* (2018) and Jeong *et al.* (2018a). Our research sought to contribute to their research agenda and to provide scientific evidence to underpin those workers' and business practices. We used Hierarchical Linear Modeling to investigate our objectives: a) to test the relationships between national culture dimensions and Informal Learning Behaviors (ILBs) and b) to test whether the interactions of these dimensions and three ILBs' antecedents - Workplace Interaction (WI) and Autonomy (WA) and Readiness to Learn (RtL) - are significant. We

chose the six cultural dimensions model (Hofstede *et al.*, 2010). It is one of the most used in organizational research (Kortsch *et al.*, 2023). Few studies have investigated the relationship between national culture and informal learning using Hofstede scores (Richter *et al.*, 2020; Welk *et al.*, 2022). No appropriate analysis technique has yet been applied for nested data (individuals in different countries) to study this relationship.

Our objective required access to data in a variety and quantity of countries that allowed the analysis of the proposed complex relationships. Accordingly, we used data from the Program for the International Assessment of Adult Competencies (PIAAC). This database includes information from tens of thousands of workers. It collected data from 34 countries and exhibited significant variability in scores in the cultural dimensions of Hofstede's model (The Culture Factor Group, 2023). Despite being sponsored by it, PIAAC did not collect data only in member countries of the Organization for Economic Cooperation and Development (OECD).

Theoretical Framework

Informal Learning Behaviors and Their Antecedents

Workplace learning covers a spectrum from formal to informal modality (Manuti *et al.*, 2015). Informal learning is generally intentional, not structured, and occurs when there is a need, motivation, and learning opportunities at work (Marsick and Watkins, 1990, 2001). It can be divided into implicit - skills are acquired without the learner's intention; reactive - there is an effort to learn, but the context does not allow reflection; and deliberative - achieving a work goal leads to skills acquisition (Eraut, 2004). There is no agreement on the nature of informal learning, whether intentional or incidental. Formal and informal learning modalities should not be divided since it is impossible to differentiate whether acquired skills result from formal or informal learning (Billett, 2002; Cairns and Malloch, 2011).

The constructs of informal learning and ILBs were differentiated by Cerasoli *et al.* (2018). Informal learning is the acquisition of knowledge, skills, and attitudes through ILBs; these are "... non-curricular behaviors and activities pursued in service of knowledge and skill acquisition that take place outside formally-designated learning contexts. Such activities are predominantly self-directed, intentional, and field based. Informal learning behaviors are not syllabus based, discrete, or linear ..." (Cerasoli *et al.*, 2018, p. 204). This definition indicates that ILBs are intentional. We adopted this in our research.

ILBs can be divided into learning from oneself and others and non-interpersonal sources (Noe *et al.*, 2013). In our research, we used three items that evaluated informal learning: learning new work-related things from co-workers or supervisors, learning by doing the tasks one performs, and keeping up to date with new products or services (OECD, nda). According to PIAAC, these items were derived from the vocational learning literature to provide measures for informal workplace learning opportunities (OECD, 2011). Considering that PIAAC sought to analyze other variables - besides informal learning - the reduced number of items adopted is understandable. However, given our sample size and the scale's internal consistency, we considered the three items sufficient for assessing ILBs.

ILBs have a myriad of antecedents. These may facilitate the issuance of ILBs or, if absent, hinder the use of these behaviors. They can be divided into 1) dispositional - such as personality and motivation to learn; and 2) situational - such as support and opportunities to learn, as well as WA and WI (Cerasoli *et al.*, 2018). These antecedents can also be divided into individual (e.g., motivation to learn and autonomy), group (e.g., interpersonal relationships), and organizational (e.g., organizational culture) levels (Jeong *et al.*, 2018a). To achieve our objective, we selected a dispositional antecedent – RtL – and two situational antecedents related to work design – WI and WA. We had three reasons for selecting these antecedents. First, they were all tested as antecedents of ILBs and showed positive and

significant results in a PIAAC sample (Lucena Barbosa and Borges-Andrade, 2022). There are a variety of antecedents, and we chose those that would apply to the database we would analyze. Second, situational antecedents - WI and WA - are frequently mentioned in Hofstede's model as occurring to a greater or lesser extent depending on the cultural dimension (Hofstede *et al.*, 2010). Therefore, variation in these antecedents may affect the issuance of ILBs. Third, RtL is a dispositional variable, not a behavior. Its items express motivation to learn and intrinsic reflection, i.e., affective and cognitive processes (Gorges *et al.*, 2016; Smith *et al.*, 2015). Culture may affect dispositional variables – such as beliefs and attitudes more strongly than behaviors (Taras *et al.*, 2011). Therefore, national culture may change RtL, and this disposition may affect ILBs.

Cultural Dimensions and ILBs

Cultural differences between the countries impacted IBM's corporate culture despite all employees being members of the same organization (Hofstede, 1980). Initially, his model had four dimensions: Power Distance, Individualism, Femininity/Masculinity, and Uncertainty Avoidance. A fifth dimension was later identified: Long-Term Orientation (Hofstede and Bond, 1988). Finally, a last dimension was added to the model: Indulgence (Hofstede *et al.*, 2010).

Below, we will describe some of the existing evidence of the relationship between the dimensions of Hofstede's model and ILBs and their antecedents, and we will formulate hypotheses covering the two antecedents inherent to work design. We did not develop hypotheses for the impact of cultural dimensions on the relationship between RtL and ILBs. We made this decision because this is a dispositional variable that can derive from several more specific constructs – affective or cognitive – different from work design variables. Therefore, analyses related to RtL will be exploratory.

The Power Distance (PD) dimension explains societal attitudes towards power inequalities. It represents the extent to which its members accept the equal – low PD – or unequal – high PD – distribution of authority, control, and status privileges (Hofstede *et al.*, 2010; House *et al.*, 2004). In Japan, a country with high PD, adopting the ILB ‘mentoring’ occurs more paternalistically (Obara *et al.*, 2021). Individuals can have their behaviors influenced by the power of relationships with supervisors and peers and by self-initiative to learn. In countries with low PD, feedback from supervisors facilitates and increases workers' creativity. In societies with high PD, this feedback can be seen as an obstacle to autonomy (Jeong *et al.*, 2018b; Kim and McLean, 2014). WI is considered one of the most relevant antecedents of ILBs (Jeong *et al.*, 2018a; Lucena Barbosa and Borges-Andrade, 2022). In countries with high PD, individuals prefer to learn formally from experts rather than colleagues (Dirani, 2009; Rao, 2011). In societies with low PD, workers feel freer to learn informally in the workplace (Ralston *et al.*, 2008; Welk *et al.*, 2022). With this information, we developed the following hypotheses:

H1a. PD has a negative and significant relationship with ILBs.

H1b. PD moderates the relationship between WI and ILBs, which will be stronger in countries with low PD rates.

H1c. PD moderates the relationship between WA and ILBs, which will be stronger in countries with low levels of PD.

Individualism expresses the degree of interdependence of the members of a society. In individualistic cultures, people think only about themselves and their immediate family; in collectivist societies – low Individualism – people belong to groups and care for them in exchange for loyalty (Hofstede *et al.*, 2010). In collectivist cultures, people prefer to work in groups and have informal contact with co-workers (Bochner and Hesketh, 1994). The Chinese collectivist society offers more opportunities for informal learning through peer

interactions (Park *et al.*, 2023; Wang *et al.*, 2024). Informal learning is directly affected by these interactions and the sharing of information in the workplace (Jeong *et al.*, 2018a). In societies with low Individualism, this sharing occurs to achieve harmonious relationships between workers; in societies with high Individualism, individuals share information for their own benefit (Kim and McLean, 2014). Collectivism has a more substantial positive effect than individualism on the intention to share knowledge (Kim, 2020). Considering that informal learning depends directly on interactions in the workplace, we can assume that cultures with low Individualism allow its occurrence more frequently than societies with high Individualism. Therefore, we formulated the hypotheses:

H2a. Individualism has a negative and significant relationship with ILBs.

H2b. Individualism moderates the relationship between WI and ILBs, which will be stronger in countries with low levels of Individualism.

H2c. Individualism moderates the relationship between WA and ILBs, which will be stronger in countries with high levels of Individualism.

The Femininity / Masculinity dimension - initially proposed by Hofstede - had its name changed to Motivation Towards Achievement and Success ([MAS], The Culture Factor Group, 2023). However, their meanings are similar: Cultures with low MAS – feminine – would seek consensus and cooperation, while societies with high MAS – masculine – would tend towards competitiveness. In cultures with high MAS, the motivation to learn is due to competition and the search for better organizational positions. At the same time, in societies with low MAS, social approval and relationships motivate learning (Niles, 1995).

Masculinity was negatively and significantly correlated with the ILB ‘error orientation’ (Zotzmann *et al.*, 2019). We can assume that low and high levels of MAS can positively influence informal learning. However, it is possible that cultures with high MAS and their

characteristic competitiveness could compromise the exchange necessary for the issuance of ILBs. Therefore, we formulated the following hypotheses:

H3a. MAS has a negative and significant relationship with ILBs.

H3b. MAS moderates the relationship between WI and ILBs, which will be stronger in countries with low MAS rates.

H3c. MAS moderates the relationship between WA and ILBs, which will be stronger in countries with low rates of MAS.

Cultures high in Uncertainty Avoidance (UA) try to minimize the possibility of new or unfamiliar situations through strict laws and rules, safety and security measures, and use formality in interactions with others. On the other hand, cultures with low UA are more tolerant of opinions different from those they are accustomed to, have informal interactions, take more risks, and try to have as few rules as possible (Hofstede *et al.*, 2010; House *et al.*, 2004). People from countries with high UA frequently feel anxious about an informal learning environment (Kim and McLean, 2014). In a culture with high UA, there were reports of greater security when members were led by a mentor (Obara *et al.*, 2021). Furthermore, high UA causes workers from these cultures to prefer concrete experience and reflective observations, while workers from low UA cultures rely primarily on abstract conceptualizations and trial and error (Kim and McLean, 2014). Indirect effects of UA on the relationship between satisfaction with training and the informal learning strategy 'learning from written material' were found by Richter *et al.* (2020). According to the authors, in countries with high UA, satisfaction with training generally tends to be higher due to the creation of clarity led by management. As a result, workers who have undergone training are interested in complementing it by seeking support in written material rather than looking for interpersonal sources (for example, colleagues and supervisors). Therefore, we formulated the hypotheses:

H4a. UA has a negative and significant relationship with ILBs.

H4b. UA moderates the relationship between WI and ILBs, which will be stronger in countries with low levels of UA.

H4c. UA moderates the relationship between WA and ILBs, which will be stronger in countries with low levels of UA.

The Long-Term Orientation (LTO) dimension explains how individuals from different cultures deal with connections between the past and the present and with future challenges. Normative societies - low LTO - maintain traditions and are not prone to change; cultures with high LTO are pragmatic and encourage education to prepare for the future (Hofstede *et al.*, 2010). Societies with low LTO tend to see informal learning as a solution to face challenges and a performance tool, while cultures with high LTO understand learning as a tool for personal development rather than performance (Kim and McLean, 2014; Rao, 2011). Therefore, we formulated the following hypotheses:

H5a. LTO has a negative and significant relationship with ILBs.

H5b. LTO moderates the relationship between WI and ILBs, which will be stronger in countries with low LTO rates.

H5c. LTO moderates the relationship between WA and ILBs, which will be stronger in countries with low LTO rates.

The Indulgence dimension is the degree to which people try to control their desires and impulses according to their upbringing (The Culture Factor Group, 2023). Cultures with high Indulgence tend to be optimistic and place importance on leisure and enjoying life; on the other hand, cultures with low Indulgence tend to be more pessimistic and prefer to delay gratification (Hofstede *et al.*, 2010). In a Japanese sample - a country with low Indulgence - participants highlighted the importance of putting work first (Obara *et al.*, 2021). Like LTO, there are few studies on the impact of Indulgence on ILBs, probably because they are

dimensions later added to the model proposed by Hofstede. Even so, we can assume that in cultures with high Indulgence, relationships at work are more informal, and there is greater openness to social interactions. Therefore, it is possible that in societies with high Indulgence, members attribute more value to autonomy and more frequently seek informal learning than in cultures with low Indulgence. With this, we formulated the last hypotheses:

H6a. Indulgence has a positive and significant relationship with ILBs.

H6b. Indulgence moderates the relationship between WI and ILBs, which will be stronger in countries with low Indulgence rates.

H6c. Indulgence moderates the relationship between WA and ILBs, which will be stronger in countries with low Indulgence rates.

Method

Sample and Data Collection Procedures

Our sample was extracted from the PIAAC public database (OECD, ndb). This data was collected between 2011 and 2018 in 33 European, American, and Asian countries. For our study, we selected only participants who were working during data collection. We eliminated all missing cases in ILBs, WI, WA, and RtL - our level 1 variables. After that, we selected the country with the lowest number of respondents (n= 1,791) and adopted this value to select the samples from the other countries randomly. We aggregated country data into a single database (n = 59,103). Table I shows the sociodemographic data of the countries.

[INSERT TABLE I]

Instruments

Our level 1 variables were extracted from items of the PIAAC Background Questionnaire (OECD, nda) based on the findings described by Lucena Barbosa and Borges-Andrade (2022). The ILBs and WI items present a five-point Likert-type response scale, ranging from “never” (1) to “every day” (5). The RtL and WA items present a

five-point Likert-type response scale, ranging from “not at all” (1) to “a very high extent” (5). These authors' model related ILBs (dependent variable) to WA, WI, and RtL (independent variables). It presented adequate model fit indices, $\chi^2 = 7827$, $df = 129$; CFI = 0.93, TLI = 0.92, RMSEA = 0.06 90% CI [0.057 – 0.060], SRMR = 0.04 (Lucena Barbosa and Borges-Andrade, 2022). Below, we will describe the items extracted from each factor and the reliability indices described by these authors.

ILBs ($\alpha = 0.71$). (D_Q13a) “In your own job, how often do you learn new work-related things from co-workers or supervisors?”; (D_Q13b) “How often does your job involve learning-by-doing from the tasks you perform?”; (D_Q13c) “How often does your job involve keeping up to date with new products or services?”.

WI ($\alpha = 0.81$). “How often does your job usually involve: (F_Q02b) “instructing, training or teaching people, individually or in groups?”; (F_Q02c) “making speeches or giving presentations in front of five or more people?”; (F_Q02e) “advising people?”; (F_Q03b) “planning the activities of others?”; (F_Q04a) “persuading or influencing people?”; (F_Q04b) “negotiating with people either inside or outside your firm or organization?”.

WA ($\alpha = 0.83$). “To what extent can you choose or change: (D_Q11a) “the sequence of your tasks?”; (D_Q11b) “how do you do your work?”; (D_Q11c) “the speed or rate at which you work?”.

RtL ($\alpha = 0.86$). (I_Q04b) “When I hear or read about new ideas, I try to relate them to real-life situations to which they might apply”; (I_Q04d) “I like learning new things”; (I_Q04h) “When I come across something new, I try to relate it to what I already know”; (I_Q04j) “I like to get to the bottom of difficult things”; (I_Q04l) “I like to figure out how different ideas fit together”; (I_Q04m) “If I don't understand something, I look for additional information to make it clearer”.

Cultural Dimensions. For our level 2 variables - cultural dimensions of countries -we selected the scores on a website designed to use the Hofstede model for organizational consultancy (The Culture Factor Group, 2023). The website does not show Cyprus scores, so we did not analyze this sample. There are no Indulgence dimension scores for Ecuador and Israel; therefore, these countries were excluded from the analysis involving this dimension. The Hofstede scale ranges from 0 to 100 (50 = medium level). Scores are frequently updated, and evidence of validity has recently been obtained (Minkov and Kaasa, 2022). Table II presents the Countries and their respective scores on the cultural dimensions of Hofstede's model.

[INSERT TABLE II]

Data analysis

We employed Hierarchical Linear Modeling (HLM). Our dataset consisted of two hierarchically nested levels: 59,103 individuals nested in 33 countries. To test our hypotheses, we developed a set of multilevel models applying an incremental improvement procedure (Hox, 2002). When building these models, all variables were grand mean centered. Initially, we tested whether the variables in our model - collected at the individual level - could be aggregated at the country level. We calculated Intraclass Correlation Coefficients ([ICC]; Koch, 1983) to evaluate the ratio between the variance between groups and the total variance. ICCs that present values around 0.05 justify using multilevel analysis (Hayes, 2006). Our results indicated ICC values sufficient for applying HLM (ILBs = 0.070; WI = 0.057; WA = 0.081; RtL = 0.073). Due to our sample size, we selected a significance level of $p < 0.001$. We used Jamovi v software. 2.4.14.

Results

Table III presents the results of the analyses. Model 1 is an intercept-only model with ILBs as the dependent variable. The ICC indicated that the difference between countries

caused 7% of the total variation in ILBs, and the likelihood ratio test ($LRT = 3885, p < 0.001$) indicated significant between-group variability concerning the intercepts. This indicated evidence of data clustering, supporting the use of HLM. In Model 2, we added WI, WA, and RtL as level 1 independent variables (IVs). Only WI and RtL were significant predictors of ILBs.

In Model 3, we introduced all level 1 and level 2 independent variables - cultural dimensions. Only WI and RtL remained significant predictors of ILBs out of the three level 1 variables. None of the level 2 variables were significant predictors. Therefore, H1a, H2a, H3a, H4a, H5a and H6a were rejected. In Model 4, we included the interaction terms of level 1 IVs and cultural dimensions to directly test the effects of IVs on ILBs and how each cultural dimension could moderate this relationship. According to the results, we did not find significant relationships between the Long Term Orientation, Indulgence, and Uncertainty Avoidance dimensions. Therefore, H4b, H4c, H5b, H5c, H6b, and H6c were rejected. The results were significant for PD (WA and RtL), INDIV (WI), and MAS (WA); thus, H1b, H2c, and H3b were rejected. However, all the estimates were extremely low in magnitude. The results showed that compared to Model 2, the overall model fit for each of the two incremental models (with the level 2 variables added) deteriorated significantly (Δ Deviance = 163988, -10978, -11136 respectively, $p < 0.001$).

[INSERT TABLE III]

Table IV presents the estimates of the significant moderators at each level. PD moderated the relationship between WA and ILBs positively and significantly ($\gamma = 0.001, p < 0.001$), different from what we hypothesized. We did not hypothesize a moderating effect for RtL, but PD showed positive and significant moderation ($\gamma = 0.001, p < 0.001$). High PD strengthened their relationship with ILBs (WA: $\gamma = 0.036, p < 0.001$; RtL: $\gamma = 0.288, p < 0.001$). Therefore, H1c was partially confirmed. MAS negatively and significantly moderated

the relationship between WA and ILBs ($\gamma = -6.81e-4, p < 0.001$). The relationship between WA and ILBs was stronger when MAS scores were lower ($\gamma = 0.024, p < 0.001$); thus, H3c was confirmed. The relationship between WI and ILBs was negative and significantly moderated by INDIV ($\gamma = -9.25e-4, p < 0.001$). When INDIV presented lower scores, the relationship between WI and ILBs was stronger ($\gamma = 0.307, p < 0.001$). Therefore, H2b was confirmed.

[INSERT TABLE IV]

Discussion

Our research question was: Does national culture influence informal learning? Based on our findings, the answer is yes, but tiny. One reason for this may have been the low ICC scores of the level 1 variables. This may have occurred due to the likely high number of clusters within the country level (Hox, 2002). PIAAC collected data from people from different professions who were self-employed or working in different organizations; other clusters may also have had that influence (e.g., departments in an organization, teams, and workplaces with peculiar work design characteristics).

Other studies have pointed out the direct effect of cultural dimensions on ILBs (Richter *et al.*, 2020; Welk *et al.*, 2022). However, despite also using Hofstede scores, these studies did not apply appropriate techniques for nested data. From a multilevel perspective, we only found indirect effects for some dimensions. Although significant, our estimates were extremely low in magnitude. Therefore, our results must be interpreted cautiously, considering the direction the relationships demonstrated rather than their strength.

As part of our significant results, PD positively moderated the predictions of ILBs by WA and RtL. Both relationships were more robust when the PD scores were higher. This evidence contradicts studies that indicate that people from high PD cultures prefer to learn from experts and formal sources of knowledge, and individuals from low PD societies

spontaneously share knowledge with colleagues and supervisors (Kim and McLean, 2014; Welk *et al.*, 2022). Despite ignoring RtL, Hofstede's model describes that autonomy is lower in societies with high PD (Hofstede *et al.*, 2010). In societies with high PD, supervisor feedback can be seen as an obstacle to autonomy (Kim and McLean, 2014).

We may suppose that workers still maintain a certain degree of autonomy even in a society with high PD. Possibly, they only realize how limited this autonomy is when some hierarchical interference occurs, such as feedback from supervisors. Therefore, it is possible that there could be a strong relationship between WA and ILBs in countries with high PD when there are no interventions from superiors. As for RtL, our results may suggest that in societies with high PD, ILBs can be issued if motivation to learn and intrinsic reflection are present. Our results align with those of Jeong *et al.* (2018b). These authors reported that high PD would impact ILBs when interacting with other variables: a personal one (willingness to develop and grow) - which would encourage such behaviors - and another of work design (subordination and submission) - which would discourage them.

Collectivist societies - low Individualism - prefer more interactions and communion, and individualists value independence and autonomy (Hofstede *et al.*, 2010). People from cultures with low Individualism tended to prefer learning in groups, and people with high Individualism were inclined towards more formal learning (Kim and McLean, 2014). Our results indicated that Individualism negatively and significantly moderated the relationship between WI and ILBs. When Individualism scores were lower, this relationship was more robust. Therefore, our results regarding similar relationships are consistent with Hofstede's model and other studies.

MAS negatively and significantly moderated the relationship between WA and ILBs, which was more robust when MAS scores were lower. Cultures with high MAS would be decision-oriented – masculine cultures that tend towards competitiveness – and with low

MAS, consensus-oriented – feminine cultures that tend towards consensus and cooperation (The Culture Factor Group, 2023). Our results confirm what was found by Zotzmann *et al.* (2019). These authors reported a negative and significant relationship between masculinity - high MAS - and the ILB "error orientation". Although we did not find a direct impact of MAS on ILBs, our results were in line with our assumption that a culture with high MAS can hinder or prevent an environment that provides the emission of ILBs; thus, a cooperative environment can strengthen the relationship between WA and ILBs.

Limitations and Future Research

Despite the contributions of our pieces of evidence to the literature on the impact of national culture on informal learning, our study had some limitations. Our sample size was large, so certain relationships could be considered significant even if they were not. We sought to avoid this problem by adopting a p value < 0.001 . We limited our analysis only to Hofstede's cultural dimensions model, as this is the most used in organizational research (Kortsch *et al.*, 2023). Future research should consider using other cultural models or comparing their impacts on ILBs (Schwartz, 2006; House *et al.*, 2004; Trompenaars, 1993; Inglehart, 2000). Furthermore, studies comparing these impacts by cultural dimension scores at the country level and individual subjective self-assessments would be germane. There may be discrepancies between the cultural classification attributed to a country and its nationals' perception of it. Another comparison to be investigated would be between the cultural dimensions of countries and organizations.

Implications and Final Considerations

To the best of our knowledge, ours was the first research to investigate the impact of national culture on ILBs using multilevel modeling. Furthermore, we used data from PIAAC. The questionnaires were validated in all countries, ensuring the stability of the factorial structure and that the scales assessed the same constructs regardless of the country. This

methodological contribution was an advance in the field, and our evidence indicates several possibilities for theory and research.

Our results indicate that national culture may not directly impact ILBs. Therefore, it is necessary to consider other variables that may be present in this relationship. We investigated only three antecedents of ILBs. Researchers should expand the number of antecedents, consider including other levels of analysis - such as organizational and team levels, and analyze the perceptions of individuals on culture. This inclusion would expand the nomological network on the impact of national culture on informal learning. Currently, there is no explicit theory regarding this relationship. More empirical evidence could shift the field from a speculative basis to solid theoretical development. Our results can be informative about what future directions might be.

Regarding practical applications, our study indicates that national culture might not affect ILBs directly but still exerts an indirect effect. Organizations seek adaptation to ensure productivity and survival in a world of constant socioeconomic and technological changes. With rapid changes, it is not always possible to have financial resources and time to adapt. In this scenario, informal workplace learning becomes a strategic tool for developing human resources. Knowing when an organization must consider the influences of national culture - to support informal learning to increase productivity and effectiveness - is a challenge (Millington, 2012). Our results indicate that, when identifying the scores of the cultural dimensions of a given country, investors and supervisors should not hastily designate which workplace learning practices - formal or informal - should be adopted. It is more productive that work design and dispositional characteristics - such as RtL - are considered first so that ILBs are issued appropriately. For example, even workers in countries with high PD - which, in theory, prefer formal learning - may benefit from informal learning if there is no undermined WA or devalued RtL.

At the same time, our results can also be used to develop public policies for worker qualification. Immigration in search of work is a reality, and it may increase due to conflicts and climate change. As a result, countries must be prepared to deal with progressively diverse workforces. Our results indicate that the predictions of ILBs by WI and WA are more robust in cultures with low Individualism and MAS scores, respectively. Thus, public managers - from countries with high scores in these dimensions - can prepare workers - from low-score cultures - to resort to strategies other than interaction and autonomy if they need to resort to ILBs when faced with challenges at work. This may facilitate the adaptation of immigrants and raise their employability.

Researching the links between national cultures and informal learning is just beginning, as demonstrated by the small number of scientific publications. The knowledge to be built could enable companies to create a more inclusive and effective learning environment for their diverse workforce, leading them to become more innovative and successful organizations.

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Table I - Sociodemographic data

Country	Gender (n)		Age Group (n)					Education (n)	
	male	female	16 to 27	28 to 35	36 to 43	44 to 51	52 to 65	Up to High School	Above High School
Austria	924	867	-	-	-	-	-	-	-
Belgium	915	876	285	349	387	428	342	947	815
Canada	875	916	-	-	-	-	-	596	985
Chile	910	881	411	393	290	325	372	1230	559
Czech Republic	892	899	386	414	352	266	373	1276	509
Ecuador	1031	760	490	434	352	256	259	1394	396
Estonia	811	980	321	328	363	351	428	893	891
Finland	848	943	283	354	318	374	462	809	975
France	939	852	268	318	402	397	406	1084	699
Germany	905	886	-	-	-	-	-	1040	735
Greece	951	840	234	352	507	433	265	942	822
Hungary	946	845	-	-	-	-	-	1095	696
Ireland	819	972	252	492	442	297	308	568	1211
Israel	957	834	502	368	366	228	327	942	849
Italy	964	827	169	324	497	454	347	1380	404
Kazakhstan	789	1002	313	461	403	350	264	751	1038
South Korea	1004	787	273	362	388	408	360	963	825
Lithuania	714	1077	272	295	317	368	539	593	1195
Mexico	1093	698	487	370	381	274	279	1474	316
Netherlands	915	875	385	245	373	365	423	1181	601
New Zealand	797	994	-	-	-	-	-	769	928
Norway	921	870	375	291	376	352	397	825	944
Peru	1007	784	418	395	353	294	331	1072	718
Poland	1040	751	1037	217	190	169	178	1064	724
Russia	664	1126	601	363	266	279	282	235	1553
Singapore	956	835	-	-	-	-	-	568	1223

Country	Gender (n)		Age Group (n)					Education (n)	
	male	female	16 to 27	28 to 35	36 to 43	44 to 51	52 to 65	Up to High School	Above High School
Slovak Republic	937	854	297	337	380	393	384	1353	435
Slovenia	895	896	182	382	442	467	318	1146	643
Spain	974	817	242	398	435	407	309	1027	755
Sweden	921	870	285	279	337	367	523	923	853
Turkey	1330	461	373	577	487	245	109	1204	585
United Kingdom	762	1029	340	391	367	332	361	963	813
United States	878	913	-	-	-	-	-	818	971

Table II - Classification of countries according to Hofstede's model

Country	PD	INDIV	MAS	UA	LTO	INDUL
Germany	35	79	66	65	57	40
Austria	11	77	79	70	47	63
Belgium	65	81	54	94	61	57
Canada	38	72	52	48	54	68
Kazakhstan	88	20	50	88	85	22
Chile	63	49	28	86	12	68
South Korea	60	18	39	85	100	29
Ecuador	78	24	63	67	24	-
Slovak Republic	100	57	100	51	53	28
Slovenia	71	81	19	88	50	48
Spain	57	67	42	86	47	44
United States*	40	60	62	46	50	68
Estonia	40	62	30	60	71	16
Finland	33	75	26	59	63	57
France	68	74	43	86	60	48
Greece	60	59	57	100	51	50
Netherlands	38	100	14	53	67	68
Hungary	46	71	88	82	45	31
Ireland	28	58	68	35	51	65
Israel	13	56	47	81	47	-
Italy	50	53	70	75	39	30
Lithuania	42	55	19	65	49	16
Mexico	81	34	69	82	23	97
New Zealand	22	69	58	49	55	75
Norway	31	81	8	50	55	55
Peru	64	20	42	87	5	46
Poland	68	47	64	93	49	29
United Kingdom	35	76	66	35	60	69
Czech Republic	57	70	57	74	51	29

Country	PD	INDIV	MAS	UA	LTO	INDUL
Russia	93	46	36	95	58	20
Singapore	74	43	48	8	67	46
Sweden	31	87	5	29	52	78
Turkey	66	46	45	85	35	49

Notes: Data is from *Country comparison - Hofstede insights*, by The Culture Factor Group, 2023, (<https://www.hofstede-insights.com/country-comparison>). *Copyright* 2023 Hofstede Insights Oy. PD = Power Distance; INDIV = Individualism; MAS = Motivation Towards Achievement and Success; UA = Uncertainty Avoidance; LTO = Long-Term Orientation; INDUL = Indulgence.

*The database for this country was from 2012.

Table III - HLM regressions predicting ILBs

Predictor	Model 1	Model 2	Model 3	Model 4
Intercept	3.28***	3.279***	3.270***	3.271***
WA		0.012**	0.008*	0.009*
WI		0.290***	0.289***	0.288***
RtL		0.266***	0.263***	0.259***
PD			0.002	0.002
INDIV			0.003	0.003
MAS			-5.09e-4	-4.03e-4
UA			-3.48e-5	-8.04e-5
LTO			-0.005*	-0.005*
INDUL			0.004*	0.004
WA x PD				0.001***
WI x PD				5.21e-4*
RtL x PD				0.001***
WA x INDIV				8.55e-6
WI x INDIV				-9.25e-4***
RtL x INDIV				3.51e-4
WA x MAS				-6.81e-4***
WI x MAS				-3.95e-4*
RtL x MAS				8.21e-4**
WA x UA				-6.98e-4**
WI x UA				-3.24e-4
RtL x UA				-5.27e-5
WA x LTO				-2.88e-4
WI x LTO				1.79e-4
RtL x LTO				-4.00e-4
WA x INDUL				1.96e-4
WI x INDUL				4.38e-4
RtL x INDUL				6.29e-4
Variance of random components				
Individual-level	0.082	0.050	0.035	0.036
Country-level	1.121***	0.936***	0.919***	0.917***
Δ Deviance ^a	-	163988***	-10978***	-11136***

Notes: WA = Workplace Autonomy; WI = Workplace Interaction; RtL = Readiness to Learn; PD = Power Distance; INDIV = Individualism; MAS = Motivation towards Achievement and Success; UA = Uncertainty Avoidance; LTO = Long Term Orientation; INDUL = Indulgence.

^a The change in deviance (Deviance) is distributed as a χ^2 with degrees of freedom equal to the difference in the parameters between models.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table IV - Parameter estimates at each level of significant moderators

IV	Moderator Levels	Estimate	SE	95% Confidence Interval		z	p
				Lower	Upper		
PD							
WA	Mean-1-SD	-0.018	0.007	-0.031	-0.005	-2.66	0.008
	Mean	0.009	0.004	8.29e-4	0.017	2.16	0.031
	Mean+1-SD	0.036	0.007	0.023	0.049	5.31	0.000
RtL	Mean-1-SD	0.230	0.010	0.210	0.250	22.5	0.000
	Mean	0.259	0.006	0.247	0.271	41.5	0.000
	Mean+1-SD	0.288	0.010	0.269	0.308	29.1	0.000
INDIV							
WI	Mean-1-SD	0.307	0.006	0.294	0.319	48.4	0.000
	Mean	0.288	0.004	0.280	0.296	71.5	0.000
	Mean+1-SD	0.270	0.006	0.257	0.283	41.9	0.000
MAS							
WA	Mean-1-SD	0.024	0.006	0.012	0.036	3.99	0.000
	Mean	0.008	0.004	8.29e-4	0.018	2.16	0.031
	Mean+1-SD	-0.006	0.006	-0.018	0.005	-1.12	0.262

Notes: IV = Independent Variable; PD = Power Distance; INDIV = Individualism; MAS =

Motivation towards Achievement and Success; WA = Workplace Autonomy; WI =

Workplace Interaction; RtL = Readiness to Learn.

Discussão Geral

Nesta seção, discutiremos de maneira holística os resultados dos três estudos. Para facilitar sua compreensão, ela será estruturada de acordo com subseções cujos títulos são os de cada um dos respectivos estudos anteriormente apresentados. Em cada uma das subseções são discutidos os resultados obtidos e sua relação com os objetivos almejados e as implicações práticas, teóricas e/ou metodológicas considerando todos os resultados apresentados nesta Tese. A última subseção é dedicada a ressaltar os resultados obtidos nas amostras de países latinoamericanos e suas possíveis implicações para o Brasil. A intenção desta subseção é refletir sobre o que mais se destacou em cada estudo e uma possível relação com os resultados obtidos de maneira geral, não repetindo o que foi discutido em cada um deles.

Comportamentos de Aprendizagem Informal, Interação e Autonomia no Trabalho e Prontidão para Aprender

O objetivo do Estudo 1 foi testar um modelo de mensuração com evidências de validade e se neste a Interação e Autonomia no Trabalho e Prontidão para Aprender ainda são antecedentes significativos de CAIs quando testados em uma amostra heterogênea em termos de idade, escolaridade e profissões (Lucena Barbosa & Borges-Andrade, 2022). Nossa preocupação em primeiro testar as propriedades psicométricas do modelo preditivo que analisaríamos ocorreu por estarmos utilizando dados secundários. Apesar das extensas informações a respeito do desenvolvimento do PIAAC, desde a construção dos itens do questionário, os resultados psicométricos são apresentados apenas em relação aos estudos pilotos (OECD, 2013). Nesse caso, consideramos relevante identificar se os fatores e os itens permaneceriam os mesmos nas amostras disponibilizadas no sítio da internet (OECD, n.d.a).

Vários estudos nos campos da aprendizagem e comportamento organizacional utilizaram os dados do PIAAC (Olsen & Tikkanen, 2018). Entretanto, constatamos uma

tendência de alguns desses de não seguirem as intenções originais de medidas do PIAAC, selecionando itens aleatórios para formar fatores sem justificativa para tal (Liu et al., 2019; Naval et al., 2020; Nygren et al., 2019; Sulkunen et al., 2021). Consideramos que a falta de controle sobre as medidas utilizadas e os procedimentos de coleta exigem uma leitura minuciosa dos documentos disponibilizados pela OCDE e uma comparação com a recente literatura científica que sistematizou o constructo CAIs. Após isso, realizamos análises fatoriais exploratórias, confirmatórias e de confiabilidade com os dados do PIAAC. Essas indicaram a mesma solução fatorial inicial do PIAAC, mas apontaram para a remoção de dois itens. Com esses resultados, prosseguimos com nossas análises.

Os resultados indicaram que Interação e Autonomia no Trabalho e Prontidão para Aprender são antecedentes significativos de CAIs (Lucena Barbosa & Borges-Andrade, 2022). Entretanto, a Autonomia no Trabalho teve consideravelmente o menor valor de predição em relação aos outros antecedentes. A princípio, julgamos que esses resultados poderiam ter sido afetados pelos tipos de CAIs utilizados em nossa pesquisa, como nos resultados de Kortsch et al. (2019). Entretanto, também destacamos que a heterogeneidade da amostra pode ter impactado nossos resultados. Isso foi confirmado no Estudo 2, onde analisamos as amostras dos países separadamente. Os resultados indicaram que em alguns países a Autonomia no Trabalho foi antecedente significativo – Áustria, Bélgica, Cazaquistão, Chile, Equador, Eslováquia, Eslovênia, Estônia, França, Grécia, Irlanda, Itália, Lituânia, México, Peru, Reino Unido, Rússia, Suécia e Turquia –, mas não em outros – Canadá, Coreia do Sul, Espanha, Estados Unidos, Finlândia, Hungria, Israel, Noruega, Polônia e Tchêquia. Contudo, a Interação no Trabalho e a Prontidão para Aprender foram antecedentes significativos de CAIs em todos os países.

A homogeneidade e o tamanho pequeno das amostras em estudos sobre aprendizagem informal são alvos de crítica por não serem representativos o suficiente e sofrer com vieses

(Jeong et al., 2018). Nossos resultados apontam que até amostras heterogêneas também podem implicar em problemas. Mesmo assim, a análise dessas amostras oferece a possibilidade de uma investigação mais profunda sobre como diferentes variáveis sociodemográficas exercem impacto na variável dependente – CAIs, no nosso caso. Detectamos que os gerentes, os indivíduos que apontaram necessidade adicional de treinamento, os com escolaridade superior ao Ensino Médio, os mais jovens e as pessoas que disseram que o número de pessoas aumentou na organização recorreram mais aos CAIs do que suas contrapartes. Apesar de não ser alvo do Estudo 1, mas relevante para esta Tese, os países também se mostraram como variável de interesse na análise da relação dos antecedentes com CAIs. As implicações metodológicas do nosso estudo parecem indicar que, caso a pesquisa conte amostras heterogêneas, é necessário um escrutínio maior de como todas as possíveis diferenças dentro da amostra podem afetar a relação entre variáveis antecedentes e critério. Se tivéssemos incluído a variável País teríamos detectado não só que a Autonomia no Trabalho não era antecedente significativo em todos os países, mas também identificar que existe diferença na emissão de CAIs por País.

Nossos resultados também tiveram implicações teóricas. A Autonomia no Trabalho é antecedente relevante de CAIs (Borges-Andrade & Sampaio, 2019; Cerasoli et al., 2018; Jeong et al., 2018a; Noe et al., 2017; Takase et al., 2018). Entretanto, o Estudo 1 indicou esse como o preditor mais fraco e o Estudo 2 apontou que isso provavelmente se deve à diferença entre os países. Modelos teóricos de aprendizagem no trabalho tendem a buscar uma certa “universalidade”, podendo ser aplicados em diferentes pesquisas com diferentes amostras (Eraut, 2004; Ellström, 2011; Illeris, 2004; Tynjälä, 2013). Pela parcimônia, muitos deles envolvem uma série limitada de variáveis e como estas se relacionam com a aprendizagem no trabalho. Entretanto, alguns fatores relevantes podem não ser incluídos e estes terem algum efeito. No Estudo 3, a Autonomia no Trabalho não foi antecedente significativo, mas a

interação desta com as dimensões culturais Distância de Poder e Motivação para Realização e Sucesso foi. Como não existe um modelo teórico sobre a relação entre cultura nacional e aprendizagem informal no trabalho, essas dimensões – ou outras que não avaliamos – nem são consideradas nos modelos teóricos sobre aprendizagem no trabalho. Isso indica a necessidade de mais pesquisas que identifiquem possíveis antecedentes de CAIs ainda desconsiderados.

Explorar todos os possíveis antecedentes de CAIs não era o escopo da nossa Tese. Buscamos identificar alguns antecedentes que se sustentassem como significativos independentemente das características da amostra. Do ponto de vista prático, nossos resultados parecem indicar que organizações e gerentes devem – caso queiram utilizar a aprendizagem informal no trabalho como ferramenta estratégica – estimular principalmente a Interação no Trabalho e a Prontidão para Aprender. Criar um ambiente de maior convivência e proximidade pode favorecer que trabalhadores se sintam mais confortáveis em emitir CAIs para lidar com as demandas e melhorar seu desempenho. Da mesma forma, identificar, selecionar e contratar trabalhadores que apresentem uma maior Prontidão para Aprender pode facilitar a emissão de CAIs até mesmo se o desenho do trabalho não for tão favorável para isso, haja visto que essa é uma variável disposicional.

O Papel da Participação em Treinamento na Relação entre Aprendizagem Informal e seus Antecedentes

No Estudo 2, analisamos a relação entre participação em treinamento e CAIs, além de investigar o possível papel moderador da participação em treinamento na relação entre Interação e Autonomia no Trabalho e Prontidão para Aprender e CAIs (Lucena Barbosa & Borges-Andrade, 2024a). Para isso, analisamos tanto a amostra agregada dos países – como no Estudo 1 – quanto as amostras separadas por País – para identificar se os países podem ter contribuído para o poder de predição das variáveis.

Nossos resultados indicaram que tanto na amostra agregada quanto nas amostras separadas por países, a participação em treinamento exibiu correlação positiva e significativa com CAIs. Além disso, a mesma similaridade ocorreu quando comparamos os grupos de participantes de treinamento e de não participantes. Os participantes de treinamento apresentaram médias maiores de ocorrência de CAIs do que os não participantes na amostra agregada e nas amostras separadas. Isso indica que participar de treinamentos pode ter um efeito estimulador da emissão de CAIs.

A discrepância dos resultados ocorreu quando testamos se a participação em treinamento moderava a relação entre CAIs e seus antecedentes. Enquanto na amostra agregada somente as variáveis contextuais tiveram seu relacionamento com CAIs moderado pela participação em treinamento, as amostras dos países não demonstraram um padrão de resultados. Diferente da amostra agregada, a participação em treinamento moderou a relação entre a variável disposicional Prontidão para Aprender e CAIs em quatro países – Cazaquistão, Eslovênia, Polônia e Singapura. Como na amostra agregada, a relação entre Autonomia no Trabalho e CAIs foi moderada por participação em treinamento em Alemanha, Chipre, Holanda, Nova Zelândia e Singapura, e entre Interação no Trabalho e CAIs em Alemanha, Canadá, Cazaquistão, Chile, Eslováquia, Eslovênia, Estônia, Israel e México. A princípio, investigamos se as características sociodemográficas desses países poderiam influenciar esses resultados. As análises descritivas não indicaram um padrão explicativo. Todos esses países diferem em relação aos seus sistemas educacionais e às suas estruturas de mercado de trabalho (OECD, n.d.c). Descrever todas essas diferenças vai além do escopo desta Tese. Com isso, buscamos informações específicas sobre a relação entre treinamento e aprendizagem informal.

Em relação à aprendizagem informal no trabalho, em 2012 todos os estados-membros da União Europeia se comprometeram a reconhecer igualmente a aprendizagem formal, não

formal e informal, implementar políticas e promover iniciativas de validação de aprendizagem não formal e informal até 2018 (Council of the European Union, 2012). Isso implicaria em identificar, documentar, avaliar e, quando possível, certificar a aprendizagem fora da educação formal especificamente no ambiente de trabalho. Esse acordo busca incluir trabalhadores imigrantes e/ou pessoas sem acesso a altos níveis de escolaridade no mercado de trabalho. Muitas vezes, a qualificação prévia desses grupos é desconsiderada, seja porque seus certificados de educação formal não são reconhecidos no país para o qual imigraram ou porque a aprendizagem adquirida no trabalho é desvalorizada em razão do nível de escolaridade do trabalhador.

A influência vertical dessa política da União Europeia sobre esse reconhecimento da aprendizagem prévia num país do sul da Europa (Portugal) e num país da Europa Central (Eslovênia) foi investigada no estudo de Guimarães e Mikulec (2021). Como não analisamos dados de Portugal, descreveremos os resultados da Eslovênia. Conforme esse estudo, a educação de adultos é baseada principalmente em programas educacionais formais e não formais (gerais, vocacionais – p. ex. programas de competências de alfabetização, cidadania ativa, coesão social, tecnologias de informação e comunicação), enquanto iniciativas de validação de aprendizagem não formal e informal representam uma forma mais marginal de oferta; essas têm como objetivo apenas a qualificação profissional. Isso acaba desvalorizando essas iniciativas, pois elas só são aplicadas a indivíduos de baixa escolaridade. Com isso, aumentam a segregação e desigualdades para os portadores de certificados dessas iniciativas e seu acesso ao mercado de trabalho fica restrito a ocupações que exigem um conjunto de qualificações mais baixo (Guimarães & Mikulec, 2021). Nossas análises indicaram que a relação entre Prontidão para Aprender e CAIs foi mais forte para o grupo que participou de treinamento e a relação entre Interação no Trabalho e CAIs foi mais forte para o grupo que não participou. É possível que ter a oportunidade de treinamento estimularia a prontidão para

aprender dos eslovenos e isso levaria a um maior uso de CAIs – de acordo com Guimarães e Mikulec (2021), a educação de adultos na Eslovênia é mais direcionada para aprendizagem formal. Por outro lado, na ausência de treinamento, os eslovenos podem suprir essa lacuna recorrendo aos CAIs. Para isso, podem se voltar para a interação no trabalho.

As medidas de aprendizagem informal adotadas pelos imigrantes, bem como aquelas oferecidas pelos empregadores nos setores de saúde e tecnologia da informação e comunicação (TIC) durante o processo de integração no mercado de trabalho no Canadá e na Alemanha, foram analisadas no estudo de Annen (2023). Os resultados indicaram que as medidas de treinamento e oportunidades de aprendizagem após a contratação geralmente são oferecidas pelas organizações em ambos os setores e em ambos os países. No Canadá, os motivos para recorrer à aprendizagem informal são o estabelecimento de redes e ganho de experiência de trabalho e referências canadenses – aculturação no sistema de saúde canadense. Na Alemanha, o propósito da aprendizagem informal no trabalho no setor da saúde é mais direcionado para a aquisição de experiência de trabalho prática. A aprendizagem informal no setor de TIC em comparação ao setor de saúde é característica em ambos os países. Além disso, qualificações formais são mais importantes no setor de TIC alemão – mais estruturado – do que no canadense – mais liberal (Annen, 2023). Nas nossas análises, a participação em treinamento moderou a relação entre Autonomia – sendo somente significativa e negativa para o grupo que participou de treinamento – e Interação no Trabalho – sendo somente significativa e positiva para o grupo que não participou – e CAIs. É possível que isso implique que em uma sociedade mais estruturada - como a alemã - a participação em treinamento possa enfraquecer a relação entre autonomia e CAIs. A respeito da relação entre Interação no Trabalho e CAIs, ela se tornou mais forte para aqueles que não participaram de treinamento tanto para a amostra alemã quanto canadense. Nossos resultados indicam que tanto em uma sociedade mais estruturada – alemã – e uma mais liberal – canadense, a

dinâmica entre Interação no Trabalho e CAIs pode ser fortalecida pela ausência de treinamento.

Como não há consenso entre os países a respeito da relação entre treinamento e aprendizagem informal no trabalho, é possível que nossos resultados tenham sido afetados por variáveis de nível micro. Um estudo de van den Elsen et al. (2022) buscou identificar a relação entre a utilidade percebida dos resultados da aprendizagem formal para o trabalho diário e as competências relacionadas à empregabilidade de funcionários, e o papel moderador da aprendizagem informal e da liderança transformacional nessa relação. As análises não indicaram a aprendizagem informal como moderador significativo, mas a liderança transformacional sim. Além disso, os resultados apontam que a utilidade percebida da aprendizagem formal para o trabalho diário pode ser mais relevante do que investigar se alguém participou do treinamento (van den Elsen et al., 2022). Nossos dados só indicavam se o respondente participou ou não de treinamento, não sobre o valor atribuído a este. A percepção de utilidade pode ter influenciado nos resultados.

Além disso, a satisfação com o treinamento pode ter contribuído para as diferenças entre os países. Esta satisfação pode resultar na emissão dos CAIs ‘busca de ajuda interpessoal’, ‘ajuda em material escrito’ e ‘aplicação prática’ (Richter et al., 2020). Adicionalmente, quando essa satisfação resulta das reflexões dos participantes do treinamento, eles recorrem mais à aprendizagem informal (Kortsch et al., 2019).

A investigação sobre a dinâmica entre a influência da participação em treinamento na relação entre CAIs e seus antecedentes em nosso estudo teve, principalmente, um caráter exploratório. Não encontramos outros estudos que tenham testado essas relações da mesma forma. A separação das amostras por países indicou que existem outras possíveis variáveis interferindo nessas relações. Entretanto, as contribuições teóricas de nossos resultados indicam que existe diferença entre as atividades de aprendizagem formal e informal e existe

complementaridade entre elas. Alguns estudos que investigam a aprendizagem no trabalho tendem a condensar essas atividades em um único fator (Naval et al., 2020; Hilkenmeier et al., 2021; Wang & Zhang, 2022). Isso pode impedir uma verificação mais detalhada e precisa sobre as relações entre a aprendizagem formal e informal com outras variáveis disposicionais e de contexto do trabalho.

Nossos resultados parecem indicar que o treinamento tem um efeito benéfico no uso de CAIs. Entretanto, essa implicação prática nem sempre tem consequências diretas. Em processos de intervenção, será preciso identificar a dinâmica entre diferentes variáveis para realmente utilizar estrategicamente a aprendizagem informal. Demonstramos, como um dos nossos achados, que os relacionamentos entre CAIs e seus antecedentes foram significativos ou não dependendo das amostras dos países. Ao elaborar um treinamento, as pessoas encarregadas da gestão ou da promoção de aprendizagem precisarão considerar os objetivos instrucionais a serem alcançados e também compreender as características do ambiente de trabalho e do público-alvo desse treinamento. Ter uma visão holística pode propiciar o uso estratégico da aprendizagem no trabalho e escolher qual dos seus tipos – formal e/ou informal – é mais adequado para satisfazer as metas de desempenho e os resultados desejados.

O Impacto da Cultura Nacional na Previsão de Comportamentos de Aprendizagem Informal

O objetivo do Estudo 3 foi investigar o impacto das seis dimensões culturais nacionais de Hofstede em CAIs e como elas moderam a previsão desses comportamentos pela Interação e Autonomia no Trabalho e Prontidão para Aprender (Lucena Barbosa & Borges-Andrade, 2024b). Para isso, aplicamos a Modelagem Linear Hierárquica para lidar com dados individuais – obtidos pelo PIAAC (OECD, n.d.a) – agregados em países – de acordo com os escores do modelo de Hofstede (The Culture Factor Group, 2023). Nenhuma das dimensões culturais exerceu impacto direto em CAIs. Encontramos resultados significativos, mas

consideravelmente reduzidos, de moderações para Distância de Poder (CAIs com Autonomia no Trabalho e Prontidão para Aprender), Individualismo (CAIs com Interação no Trabalho) e Motivação para Realização e Sucesso (CAIs com Autonomia no Trabalho). Julgamos que nossas principais contribuições foram metodológicas, por sermos o primeiro estudo – até onde sabemos – a aplicar a análise multinível para analisar o impacto da cultura nacional em CAIs, além de utilizar dados secundários para isso. A seguir, discutiremos mais sobre essas implicações e como elas podem se desdobrar para contribuições teóricas e práticas.

A princípio, cogitamos que os diminutos resultados que encontramos teriam ocorrido devido ao baixo valor dos índices de correlação intraclasse (ICC) obtidos ao agregar os dados individuais no nível de País. Os estudos que encontramos que investigavam a relação entre cultura nacional e CAIs e que também usaram os escores de Hofstede não aplicaram análise multinível (Richter et al., 2020; Welk et al., 2022). Com isso, não tínhamos como inferir se os nossos resultados reduzidos ocorreram devido aos escores em nível de País que adotamos. Entretanto, o estudo de Škerlavaj et al. (2013) também usou os escores de Hofstede e aplicou Modelagem Linear Hierárquica para investigar os efeitos moderadores das dimensões da cultura nacional em três fatores no desenvolvimento da cultura de aprendizagem organizacional. Os autores também encontraram resultados muito pequenos e significativos – assim como os nossos – para a relação entre interpretação de informações e mudanças comportamentais e cognitivas – esta foi moderada positivamente pela Distância de Poder e moderada negativamente pelo Individualismo, Masculinidade e Aversão à Incerteza (Škerlavaj et al., 2013).

A maioria das pesquisas que aplicam a análise multinível tem como base teórica os modelos de consenso; estes exigem um nível considerável de homogeneidade ou concordância dentro da unidade de análise, de modo que o construto nesse nível só é significativo na medida em que representa características compartilhadas da unidade (Chan,

1998; Klein et al., 2001). As amostras dos países analisados contavam com uma grande variedade de idades, profissões, escolaridade, entre outras características sociodemográficas. É possível que essa variedade tenha impactado nossos resultados. Nesse caso, seria interessante levar em conta outros modelos de composição que não exigem homogeneidade, como modelos de dispersão – o significado da resposta de nível da unidade é derivado da variância ou dispersão entre respostas de nível inferior (Chan, 1998; Woehr et al., 2015).

Outro aspecto que pode ter contribuído para os baixos escores dos nossos resultados foi a adoção dos escores de Hofstede (The Culture Factor Group, 2023). A metodologia utilizada, a validade, a confiabilidade e a presunção de homogeneidade dentro dos países desses escores é alvo de críticas (Sochor, 2020). Entretanto, escolhemos utilizar o trabalho de Hofstede por três razões. A primeira foi por não existir um modelo teórico sobre o impacto da cultura nacional na aprendizagem informal no trabalho. Apesar de alguns autores apontarem a existência dessa relação (Bednall et al., 2014; Kim & McLean, 2014; Taras et al., 2010), a metanálise de Cerasoli et al., (2018) e a revisão de Jeong et al. (2018a) indicaram uma escassez de estudos que confirmassem evidências empíricas disso. Isso levou à nossa segunda razão, que foi optar por um modelo robusto que tivesse sido utilizado por estudos relacionados à aprendizagem no trabalho. Com isso, selecionamos o modelo de dimensões culturais de Hofstede (Hofstede et al., 2010). Apesar das críticas, esse ainda é o modelo mais aplicado em pesquisas na área organizacional (Kortsch et al., 2023). Conforme relatamos na Introdução Geral, nossa revisão indicou poucos artigos que investigaram a relação entre cultura nacional e CAIs. Desses poucos, todos utilizaram o modelo de Hofstede. Por fim, nossa terceira razão foi que analisamos dados secundários do PIAAC (OECD, n.d.a) e para investigar como a cultura nacional interfere em CAIs e sua relação com seus antecedentes, precisamos recorrer a dados que representassem as dimensões culturais dos países abordados.

Como o PIAAC não apresenta essas informações, recorreremos aos escores de Hofstede, que já foram aplicados em outros estudos (Richter et al., 2020; Welk et al., 2022).

Já houve teste empírico para verificar se os escores de Hofstede ainda são relevantes (Beugelsdijk et al., 2015). Os autores utilizaram os dados combinados do *World Values Survey* e do *European Values Study*. Eles argumentaram que a base *World Values Survey* foi utilizada por Hofstede para a identificação das últimas dimensões de seu modelo, além de confirmar as dimensões previamente encontradas. Isso demonstrou a pertinência de utilizar os mesmos dados para comparar com os escores atribuídos por Hofstede.

Os resultados indicaram que, em média, as sociedades contemporâneas pontuam mais alto em Individualismo e Indulgência. Elas também pontuam mais baixo em Distância de Poder do que as sociedades anteriores (de acordo com os escores de Hofstede). A dimensão Aversão à Incerteza não apresentou diferenças significativas em relação aos escores de Hofstede. Além disso, as pontuações dos países nas dimensões de Hofstede concernentes às pontuações de outros países não mudaram muito. Como consequência, as diferenças culturais entre os países (ou seja, distâncias culturais) são geralmente estáveis (Beugelsdijk et al., 2015).

Além desse estudo, evidências de validade para os escores das dimensões Individualismo e Orientação de Longo Prazo foram obtidas por Minkov e Kaasa (2022), que afirmaram que estas têm um caráter objetivo, sendo preditoras de 20 variáveis relevantes nos negócios internacionais (como transparência-corrupção, liberdade política e econômica, competitividade, etc) - apresentando correlações altas com variáveis geográficas objetivas (como latitude/longitude e prevalência de patógenos). Isso diferiu do relatado por Hofstede et al. (2010) sobre as dimensões culturais serem fruto da subjetividade humana. Não nos estenderemos no relato desta pesquisa, pormenorizando esses aspectos objetivos ou subjetivos das dimensões culturais, por isto estar além do escopo desta Tese. O mais relevante

para nosso estudo foi que esse trabalho serviu como base para a última atualização dos escores das dimensões Individualismo e Orientação de Longo Prazo do sítio da *internet* de onde extraímos dados para nossas análises (The Culture Factor Group, 2023).

A análise multinível apresenta uma série de desafios, principalmente quando as unidades de análise são países (Schmidt-Catran et al., 2019). Esses autores citam alguns problemas que podem dificultar a obtenção de evidências robustas, tais como amostras de unidades insuficientes, casos atípicos (*outliers*) e as possíveis variáveis omitidas ao nível do País. No nosso estudo, analisamos dados de 33 países. Esse número é considerado suficiente para realizar a análise multinível (Elff et al., 2016). Quanto à presença de casos atípicos, calculamos a distância de Cook e DFBETAs e os resultados não indicaram qualquer ocorrência que pudesse enviesar os resultados. Entretanto, é possível que existam variáveis omitidas no nível de País. Como nossa pesquisa analisou dois níveis, é possível que outros níveis inferiores ao de país estejam presentes e exerçam influência maior e mais direta no nível individual (Hox, 2010). Esses níveis podem estar ligados aos tipos de organização, de departamentos em uma organização, de equipes e de locais de trabalho com características peculiares de desenho do trabalho. A cultura de uma organização pode ser mais forte e anular o efeito da cultura nacional em relação a CAIs, de acordo com o estudo de Welk et al. (2022).

As implicações metodológicas do nosso estudo tendem a apontar a possibilidade de uma complexa rede nomológica a respeito da relação entre cultura nacional e CAIs. Nossos resultados sugerem que talvez seja melhor que a exploração dessa rede tenha início a partir das percepções dos indivíduos sobre a cultura de seus respectivos países. Dois artigos que encontramos em nossa revisão integrativa optaram por esse caminho (Kim, 2020; Zotzmann et al., 2019). Apesar da diferença entre nosso estudo e a pesquisa de Zotzmann et al. (2019) quanto ao nível de análise das dimensões culturais, nossos resultados foram similares em relação à dimensão Masculinidade – Motivação para Realização e Sucesso em nosso estudo.

Zotzmann et al. (2019) relataram uma relação negativa e significativa entre masculinidade - Motivação para Realização e Sucesso alta – e o CAI “orientação ao erro”. Nosso estudo não encontrou relação direta, mas essa dimensão moderou negativa e significativamente a relação entre Autonomia no Trabalho e CAIs, que foi mais robusta quando Motivação para Realização e Sucesso era baixa.

Além de avaliar as percepções dos indivíduos sobre a cultura do país, nossos resultados apontam para a inclusão de outros antecedentes de CAIs. Não encontramos impacto direto das dimensões culturais em CAIs, mas essas moderaram a relação entre alguns antecedentes e CAIs. Isso indica que o efeito da cultura nacional pode ser indireto. Outro aspecto que deve ser levado em consideração é que outros modelos de cultura nacional podem contribuir para o desenvolvimento de uma teoria sobre cultura nacional e aprendizagem informal no trabalho. Apesar do modelo de Hofstede ser o mais utilizado (Kortsch et al., 2023), outros modelos (Schwartz, 2006; House et al., 2004; Trompenaars, 1993; Inglehart, 2000) também podem fornecer informações relevantes para as interações entre CAIs e outras variáveis culturais não incluídas nas obras de Hofstede.

Nossos resultados indicam uma direção para expansão da rede nomológica sobre o impacto da cultura nacional e CAIs. Serão necessários mais estudos que levem as sugestões descritas anteriormente para a obtenção de evidências empíricas. Somente com mais evidências poderá ser desenvolvido um modelo teórico robusto sobre o tema. Uma vez desenvolvido, esse modelo pode auxiliar organizações e seus gerentes a identificarem as características culturais de seu contexto e como essas afetam os CAIs no trabalho. Além disso, uma vez identificados os aspectos culturais, seus possíveis efeitos nocivos aos CAIs podem ser neutralizados com ações pontuais. Dessa forma, a aprendizagem informal pode ser realmente utilizada como ferramenta estratégica para garantir a competitividade em uma economia globalizada.

Resultados dos Países Latinos e Possíveis Implicações para o Brasil

O PIAAC não incluiu uma amostra brasileira em seus dados. Apesar disso, o mesmo conta com amostras de quatro países latinoamericanos: Chile, Equador, México e Peru. De acordo com o modelo de dimensões culturais de Hofstede, esses países e o Brasil possuem culturas com alta Distância de Poder, baixo Individualismo – tendem ao coletivismo –, alta Aversão à Incerteza, baixa Orientação de Longo Prazo e alta Indulgência. Isso não se aplica ao Equador, por não constarem os escores para essa dimensão no sítio da *internet* onde retiramos informações para nossas análises, e ao Peru – baixa Indulgência (The Culture Factor Group, 2023). Isso significa que nesses países, as pessoas: aceitam uma distribuição desigual e hierárquica do poder, tendem ser leais ao grupo ao qual pertencem e assumem a responsabilidade pelo bem-estar umas das outras, tentam tornar a vida o mais previsível e controlável possível, tendem a dar mais ênfase às normas, à consistência e à verdade, são tipicamente religiosos e nacionalistas, e permitem ou encorajam a gratificação relativamente livre de seus impulsos e emoções (Hofstede et al., 2010).

Houve discrepância em relação à cultura nacional no que diz respeito à dimensão Motivação para Realização e Sucesso – antiga Masculinidade/Feminilidade. De acordo com os escores, Brasil, Chile e Peru são sociedades com baixa Motivação para Realização e Sucesso – com o Brasil tendendo a ser quase mediano (seu escore é de 49/100) – e Equador e México pontuam mais alto nesta dimensão (The Culture Factor Group, 2023). Isso indica que brasileiros, chilenos e peruanos buscam o consenso em suas relações interpessoais – sendo o sucesso definido pelas qualidades dessas e pela qualidade de vida – e precisam sentir um senso de pertencimento dentro de um grupo social e o sucesso; já equatorianos e mexicanos tendem a ser competitivos – a competição é direcionada para membros de outros grupos (ou classes sociais) em vez de para os membros do seu próprio grupo – e buscam associação em grupos que lhes dão status e recompensas vinculadas ao desempenho (Hofstede et al., 2010).

Além das similaridades em relação à cultura – pelo menos de acordo com as dimensões culturais do modelo de Hofstede – Brasil, Chile, Equador, México e Peru são países classificados como de renda média alta pelo Banco Mundial; para isso, são usados dados do produto nacional bruto (PIB) per capita obtidos de economistas em unidades nacionais do Banco Mundial que se baseiam principalmente em dados oficiais publicados pelos países (The World Bank, 2023). Adicionalmente, nesses países a porcentagem de empregos informais é significativamente elevada – enquanto Brasil e Chile adotam estratégias sistêmicas para tentar mitigar essa informalidade, México e Peru adotam algumas medidas sem uma abordagem coerente. O Equador ainda está nos estágios iniciais de abordagem da informalidade – e as políticas de inovação são guiadas por uma estratégia global de inovação ou por um plano nacional – e a implementação de políticas de inovação é limitada por limitações de pessoal ou orçamentárias nas agências de inovação (OECD/CAF/SELA, 2024).

Não podemos inferir que as respostas de uma amostra brasileira aos itens analisados nesta Tese culminariam nos mesmos resultados obtidos nas amostras de Chile, Equador, México e Peru. Porém, podemos considerar as similaridades sociodemográficas entre esses países e o Brasil. Portanto, buscamos comparar alguns dos nossos resultados com estudos que tenham investigado a relação entre as variáveis abordadas em nossa pesquisa. Lembramos que a variável Prontidão para Aprender foi desenvolvida para o PIAAC e compreende itens que envolvem motivação para aprender e reflexão intrínseca (Gorges et al., 2016; Smith et al., 2015). Dessa forma, além de buscar estudos que pudessem ter usado a mesma terminologia que o PIAAC, também buscamos estudos que investigaram esses aspectos. Não encontramos estudos que investigassem o impacto da cultura nacional em CAIs em amostras brasileiras. Portanto, não faremos inferências sobre se os resultados do Estudo 3 poderiam ser

aplicados ao Brasil, mas destacamos as similaridades deste em relação às dimensões culturais analisadas nas amostras de países latinoamericanos.

De acordo com análises das amostras separadas por países do Estudo 2, todos os antecedentes analisados – Autonomia e Interação no Trabalho e Prontidão para Aprender – apresentaram relação positiva e significativa com CAIs para Chile, Equador, México e Peru (Lucena Barbosa & Borges-Andrade, 2024a). Nesses países, o preditor mais forte foi Prontidão para Aprender, seguido de Interação no Trabalho. Autonomia no Trabalho foi o preditor mais fraco.

Evidências de validade de percepção de efetividade das práticas de aprendizagem informal – ocorridas no ambiente de trabalho em uma amostra de empregados de uma organização que atua no ramo financeiro brasileiro – foram identificadas no estudo de Flores et al (2018). Os resultados indicaram que para estimular a aprendizagem informal é necessário um ambiente que valorize a autonomia e intensifique a interação entre os indivíduos. Além disso, perceber a aprendizagem informal como efetiva aumenta a motivação para aprender e o engajamento em estratégias diversas de aprendizagem informal (Flores et al., 2018). A autonomia e a interação também foram indicadas como antecedentes relevantes da aprendizagem informal no trabalho em profissionais de uma agência de comunicação localizada na cidade de São Paulo, por de Araujo Amaro (2014).

Outra pesquisa visou compreender como ocorrem as experiências de aprendizagem vivenciadas por técnicos administrativos de uma universidade pública brasileira (Reatto & Godoy, 2017). De acordo com seus resultados, o ambiente burocrático tende a suprimir a autonomia e é na interação entre os funcionários que se desenvolvem as atividades de aprendizagem informal. A aprendizagem informal no trabalho ocorre quando há reflexão sobre as atividades, relataram esses autores.

A interação no trabalho (com colegas, clientes) foi descrita como um precursor relevante da aprendizagem informal em um estudo que buscou identificar a relação entre as estratégias de aprendizagem informal no trabalho com o desenvolvimento de competências gerenciais em uma instituição financeira pública brasileira (Santoro & Bido, 2017). A autonomia no trabalho – na tomada de decisões e métodos de trabalho – estava associada ao uso das estratégias de aprendizagem informal de aplicação prática e reflexão ativa em uma amostra constituída por profissionais de uma empresa nacional de tecnologia da informação, um grupo regional de concessionárias de veículos e um hospital cardiológico (Borges-Andrade & Sampaio, 2019).

Existem poucos estudos que buscaram investigar as relações entre os mesmos antecedentes de nossa pesquisa e a aprendizagem informal no Brasil. No entanto, os resultados que encontramos parecem ir ao encontro daqueles encontrados no Estudo 2 desta Tese. Nesse caso, destacamos a relevância das organizações considerarem como o desenho do trabalho – no que diz respeito à autonomia e às interações no trabalho – pode propiciar a aprendizagem informal. Além disso, estimular a Prontidão para Aprender – de acordo com nossos resultados para países latinos – pode ser mais significativo, pois esse antecedente – formado por motivação para aprender e reflexão intrínseca – vai ao encontro do caráter intencional da aprendizagem informal: o trabalhador deve querer aprender quando recorre aos CAIs.

A participação em treinamento só moderou significativamente a relação entre Interação no Trabalho e CAIs nas amostras do Chile e México, onde essa relação era mais forte para o grupo que não participou de treinamento (Lucena Barbosa & Borges-Andrade, 2024a). Não encontramos estudos em amostras brasileiras que testassem essas análises de moderação. Entretanto, a variável participação em treinamento foi correlacionada negativa e

significativamente com CAIs em todos os países latinos (Chile: $r = -0,156, p < 0,001$; Equador: $r = -0,241, p < 0,001$; México: $r = -0,280, p < 0,001$; Peru: $r = -0,208, p < 0,001$).

Esses resultados indicam que, quanto menos participação em treinamento, mais ocorrência de CAIs. Isso sugere que é possível que os trabalhadores recorram a CAIs na indisponibilidade de recursos formais de aprendizagem para atingir as metas de trabalho. Isso vai ao encontro dos resultados relatados por Santoro e Bido (2017) – onde a ausência de treinamentos faz os funcionários recorrerem à aprendizagem informal para aprender a usar novos sistemas e aplicativos de informática – e de Araujo Amaro (2014) – onde existia ausência de treinamentos e os trabalhadores relataram aprender informalmente no trabalho as competências necessárias para seu desempenho. Esses resultados vão ao encontro das evidências de Tannenbaum et al. (2024). Já Reatto e Godoy (2017) relataram que mesmo em treinamentos os funcionários recorrem à aprendizagem informal por meio da discussão entre colegas para a adequação do conteúdo, considerando as particularidades de seu ambiente de trabalho.

Em um cenário de constantes mudanças, a aprendizagem pode ser relevante para a adaptação de trabalhadores. Entretanto, nem sempre as organizações podem realizar treinamentos, seja por falta de recursos financeiros ou de tempo. Nossos resultados sugerem que organizações brasileiras podem recorrer aos CAIs como uma alternativa aos treinamentos, favorecendo a sustentabilidade do desempenho e produtividade dos trabalhadores e a competitividade entre elas.

Conclusão

Afirma-se que a aprendizagem informal pode ser uma ferramenta estratégica para lidar com as constantes transformações do mundo do trabalho globalizado. Entretanto, para ter esse caráter estratégico, são necessárias evidências empíricas a respeito de quais variáveis podem influenciar a emissão de CAIs. Esses são os comportamentos autodirigidos e

intencionais utilizados no ambiente de trabalho para a aquisição de conhecimento e habilidades – a aprendizagem informal. Identificar variáveis que se mantenham como significativas – independentemente das características da amostra – pode permitir o desenvolvimento de políticas e práticas aplicáveis em diferentes contextos.

Os nossos achados parecem indicar que Interação no Trabalho e Prontidão para Aprender podem ser algumas dessas variáveis. Além de explorar a relação direta entre CAIs e seus antecedentes, expandimos nossas análises para investigar a dinâmica entre essas e a interferência de outros fatores – participação em treinamento e a cultura nacional. A respeito do primeiro, nossos resultados indicaram o aspecto complementar da relação entre a participação em treinamento e CAIs. Porém, ao acrescentar os antecedentes nessas análises, verifica-se uma cadeia de influência mais complexa, com os resultados diferindo de acordo com a amostra. Isso pode indicar a necessidade de que o levantamento de necessidades de treinamento considere as características dos trabalhadores e do desenho do trabalho, além de somente os objetivos instrucionais. Quanto à cultura nacional, nossos resultados parecem apontar a necessidade de investigar as percepções dos indivíduos a respeito dessa – ao contrário da adoção de escores no nível de país. Outrossim, levar em consideração outros modelos culturais teóricos pode permitir a obtenção de mais evidências para a elaboração de um modelo teórico robusto sobre a relação entre cultura nacional e aprendizagem informal.

Apesar de não ser o foco desta Tese, cabe comentar sobre o uso de dados secundários. Este foi necessário para explorar as variáveis alvo desta Tese. Apesar de ser desafiador – por não termos controle sobre as variáveis no que diz respeito à inclusão de outros possíveis CAIs – o banco de dados do PIAAC fornece uma série de outras variáveis que podem ser utilizadas para explorar a complexidade das relações que envolvem a aprendizagem no trabalho. Apesar de ainda pouco utilizados na área da Psicologia, acreditamos que a apresentação cada vez mais frequente de dados advindos de instituições respeitáveis – como a

OCDE e o Banco Mundial – pode permitir a ampliação dos estudos na área. A quantidade de informações que esses bancos de dados fornecem e a diversidade amostral podem contribuir no avanço da pesquisa científica, oferecendo uma base sólida para a análise e a compreensão de diversos fenômenos.

Ademais, o aumento das exigências de submissão de projetos de pesquisa aos comitês de ética – que no Brasil ainda tem uma tendência voltada a um modelo biomédico não adequado às Ciências Sociais – pode impedir a condução de estudos, seja pela proibição imediata ou pela demora na avaliação. Pesquisas em Psicologia Organizacional e do Trabalho geralmente exigem o acordo de múltiplos agentes para ocorrer – organizações, chefias, participantes. Com isso, a demora na avaliação de um comitê de ética pode prejudicar a anuência da participação, seja por mudanças de comando ou transferências e desligamentos de trabalhadores. Esperamos que nossa Tese estimule o uso de dados secundários de fontes confiáveis como mais uma maneira eficiente de obter evidências empíricas robustas.

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